

MODEL AIRPLANE NEWS

10th Year of Publication

MAY, 1939

20c



The Lockheed XP-38 Pursuit

Page 19)

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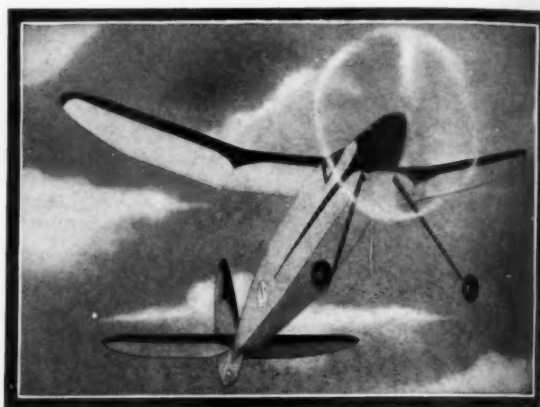
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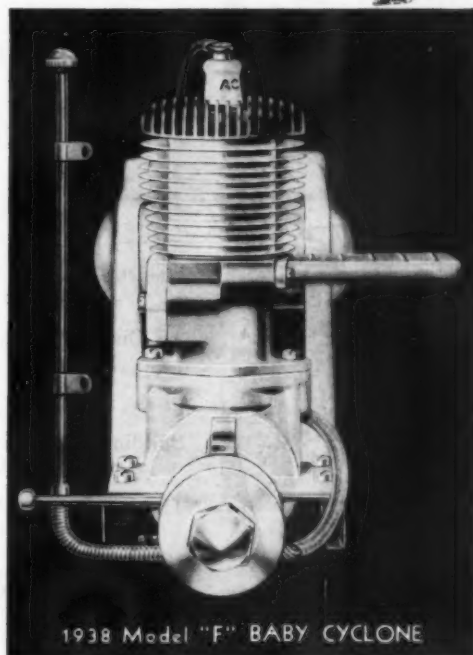
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Model AIRPLANE News

10th YEAR OF PUBLICATION

VOL. XX

No. 5

Edited by Charles Hampson Grant

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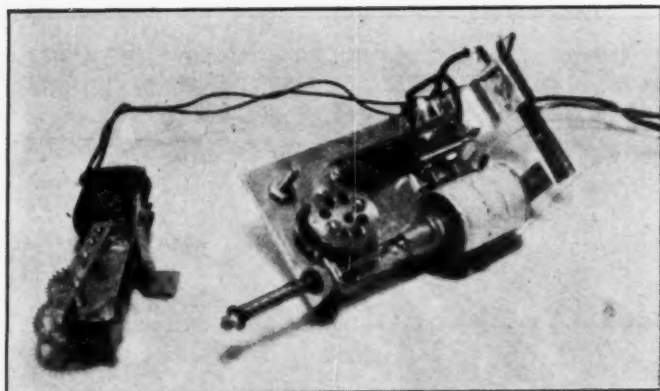


Fig. No. 3. Sequence relay, right, with motor and gear unit



Fig. No. 8. RK34 with oscillator and amplifier coil

ELEMENTS OF MODEL PLANE

A Complete Outline of Practical Radio Control Systems With Descriptions of the Equipment and How to Apply It

THE subject of radio control of model airplanes has gripped the imagination of practically all builders. The idea of being able to control the movements of a tiny, fast-moving model is certainly one that cannot be dismissed lightly. Unfortunately, as many builders and prospective builders have found to their sorrow, there is much more to radio control than meets the eye. It is *not* simply a job of building a receiver and a transmitter, of putting the former in any model plane you may

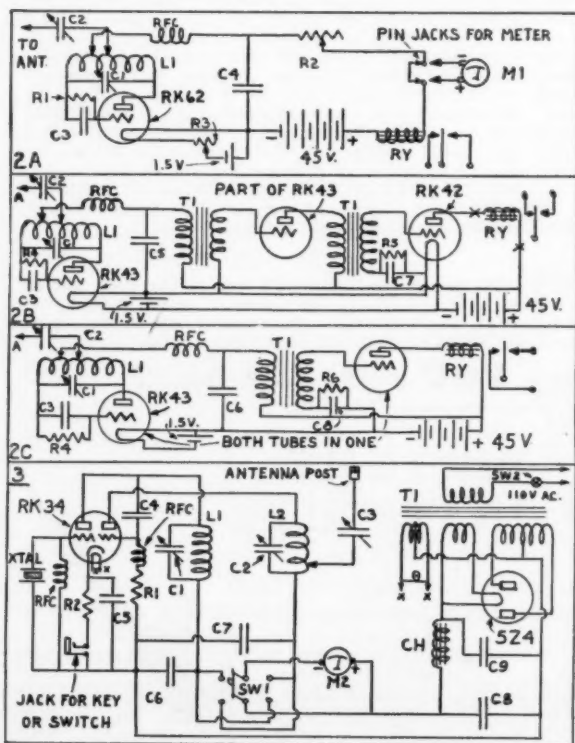
happen to possess, and presto!—radio control. There are many problems to be met, both large and small, and it is the purpose of this article and those that may follow to give detailed ideas on various angles of radio control and to show tested equipment that the builder may construct with the definite assurance that it will work.

There have been several articles in this and other publications on radio control. For those who have not access to all the radio and aviation periodicals, an outline of the various successful and practical control schemes will be given, together with com-

plete descriptions of the necessary control equipment so that the builder may use whatever scheme his requirements and facilities suggest. In line with this policy it may be noted that there will *not* be any description given of the airplane itself, although such an article may follow in due course. The main idea is to give the dope on practical equipment for radio control.

Many constructors have been unable to decide what type of rig to use on the ground end of a radio control system. Complete data will be given for at least two simple transmitters, one of which works from the regular power lines and one that may be hooked to any six volt auto battery.

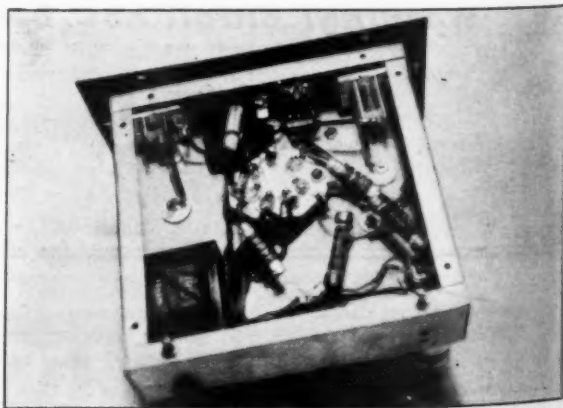
But let's get down to actual practical equipment. It has been emphasized that the simpler the apparatus in the model plane the better. The less complication there is, the better the chance that your



Diagrams of receiver and sending systems

Fig. No. 8. This inside view shows the RK34 in the center with oscillator coil at left and amplifier coil at right. The crystal holder is just to the rear of the oscillator coil

The two main tuning condensers are at the upper part of this view, while the filter choke is at lower left. The tube socket is placed about $\frac{3}{4}$ " below the chassis top



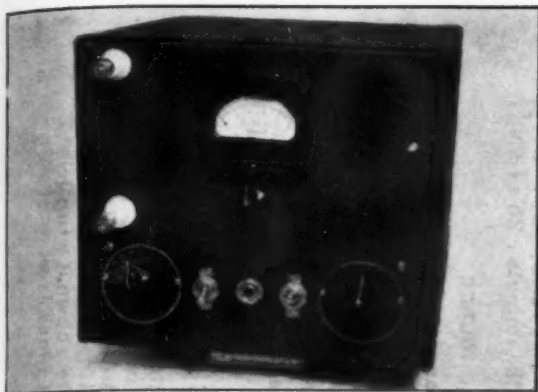


Fig. No. 7. External view of the transmitter

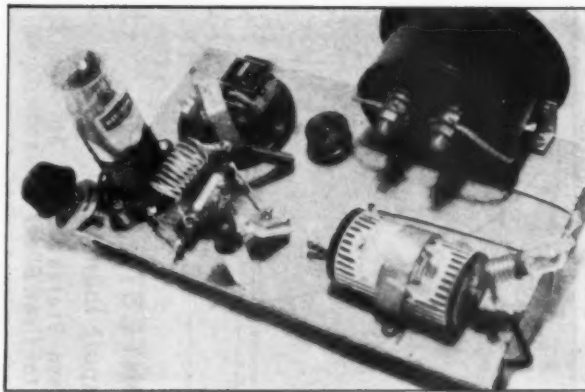


Fig. No. 5. Experimental receiver using RK62 tube

RADIO CONTROL

By
HOWARD G. McENTEE

model will operate properly when way up there in the air with the only connection between you and it an invisible and at times highly perverse thread of radio waves.

Leaving the radio end of the equipment for a moment let us consider what possibilities there are to enable operation of a single moving element, the rudder. The very simplest system is shown in Figure 1-A. Here the sensitive relay is connected to an electromagnet and battery. If the rudder is normally in a straight position and the model is adjusted to fly straight, operation of the sensitive relay allows current to flow through the electromagnet pulling down the armature which is linked by cords or by rod to the rudder. This

system has the ability to control the model in the maneuvers shown at the right, or of course, in any combination of these. This system is definitely limited since the rudder can only move a certain fixed distance without being able to stop in intermediate positions. Furthermore, if it is desired to cause a series of curves or a spiral, the magnet must stay energized which means a continuous heavy drain on the battery, a highly undesirable condition.

The next step is shown in Fig. 1-B, where the same circuit is used but a tiny motor and suitable gear train is substituted for the magnet. Here our possible

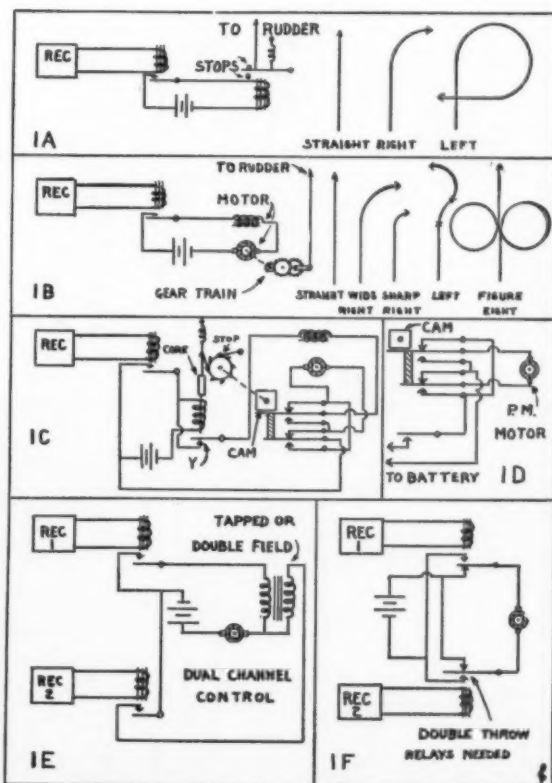
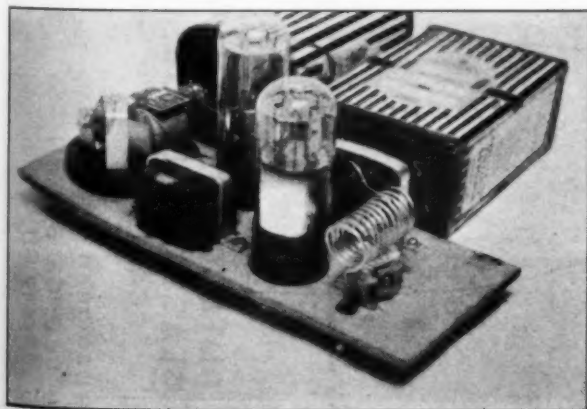
maneuvers are greatly increased in numbers, as we may make either direct right or left turns of any desired degree of sharpness. The turns to right are direct, but those to left have a slight hump as shown between X-X which is unavoidable because the motor must pass through the right turn position before going to the left.

The next step is to expand our control so that we may have selective right or left control at will without waiting for the motor to go through the undesired position (Continued on page 42)

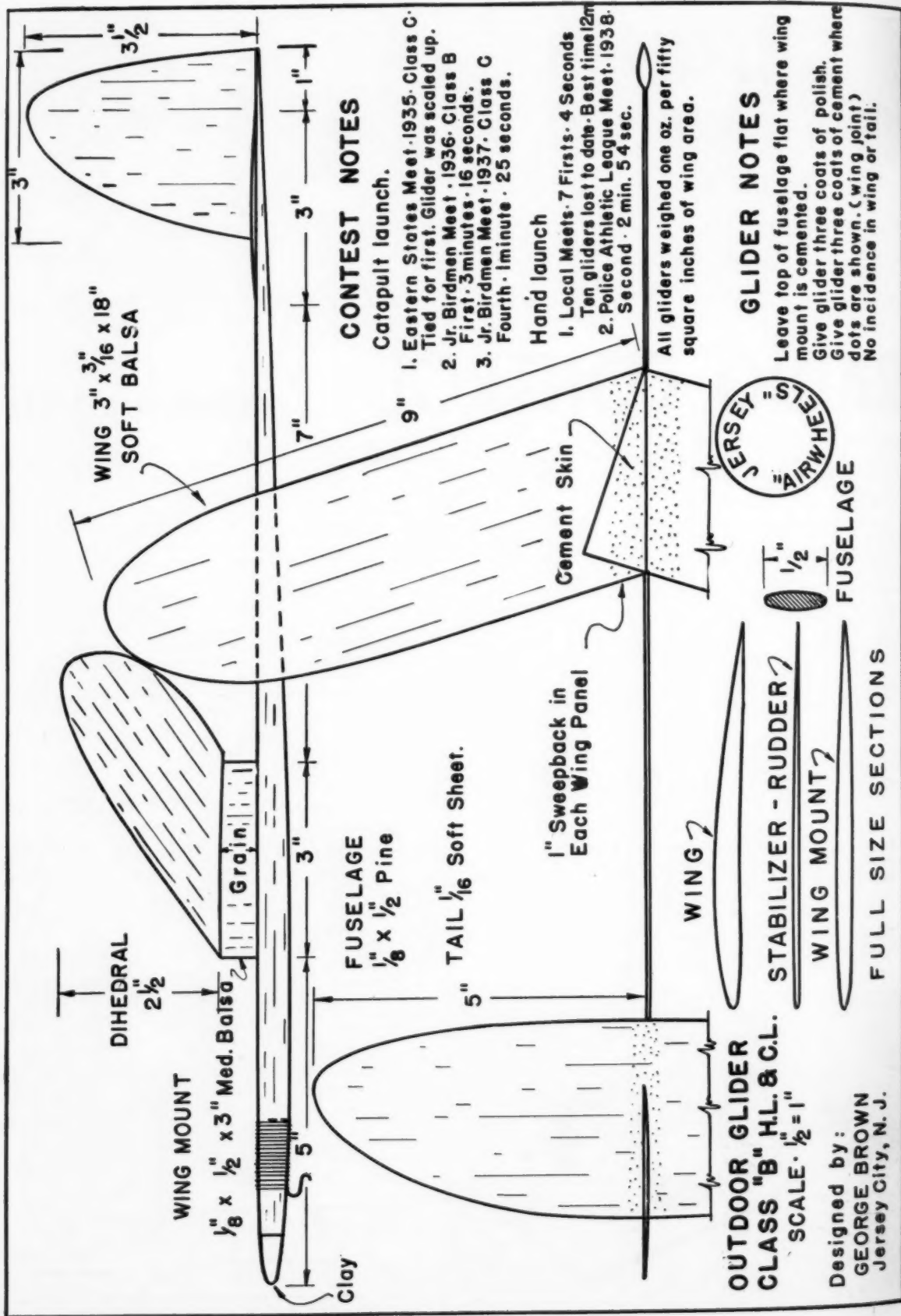
Fig. No. 7. External view of the transmitter. The collapsible antenna rod is held on the two insulators on the panel. A key or switch may be plugged in the jack in the lower center of the panel

Fig. No. 5. Experimental receiver using RK62 tube. This is a complete unit with the B battery under the wood "chassis." The flashlight bulb at lower right is a very handy indicator. This corresponds to circuit 2-A

Fig. No. 6. This receiver is shown diagrammatically in Fig. 2-B. Larger size batteries are used here and afford considerably longer life, although at some increase in weight



Diagrams of plane control operating systems



FLASH-NEWS

SPECIAL TO MODEL AIRPLANE NEWS:

MOST important news this month is the formation of Northrop Aircraft Incorporated, with the esteemed John K. Northrop, pioneer designer of the famous planes which bore his name as President and chief designer, Gage Irving, Assistant General-manager of the Douglas El Segundo Division (Northrop) as Vice-president, and a giant ultra-modern production factory in the teeming Los Angeles area; the world's most concentrated aircraft industrial region. High speed military ships will be designed and produced.

After strenuous competitive tests of the best ships of three nations, Denmark has selected the British Fairey P.4/34, streamlined dive-bomber, for licensed production in her national aircraft factory. Twenty-four machines are now under construction. The Danish P.4/34 has eight guns, special diving flaps, a top speed of 290 miles per hour and is the heaviest armed single-engine two-seater in the world.

England's latest Rolls-Royce liquid-cooled engine, the Merlin R.M.2S.M., two-speed supercharged model, develops 1135 horsepower at 15,500 feet and boasts 2040 horsepower available for take-off!

Twelve manufacturers answered the call for bids issued by the U. S. Army Air Corps' Attack-Bomber competition on March 8th. Specifications include twin-engines, heavy armament and a top speed of at least 360 miles per hour.

The navy wants air bases in New England, Hampton Roads, Va., and in Florida.

Aboard the Netherlands' two new 8350-ton cruisers will be 10 six-inch guns, 12 double forty-millimeter anti-aircraft guns, and four new Fokker catapult naval scout two-seaters. They will be low-wing and powered by an inline engine.

The War Department has just placed the largest single contract for a single aircraft engine with the Wright Aeronautical Cor-

poration. It is for five hundred Wright "Cyclone" one-thousand-plus horsepower radial engines and represents an investment of \$4,857,582.00. These will be used in new single, twin and quadri-motor fighting planes for the U. S. Army Air Corps.

On its initial flight from Oakland to Honolulu, the gargantuan Boeing Clipper broke all existing speed records with a 15 hours, 49 minutes flight. The 42-ton behemoth carried 23 persons, mail and express and nipped 2½ minutes from the late Amelia Earhart's time made on the first leg of her fatal round-the-world flight. The shakedown flight will continue to Hong Kong and return. Extensive tests will follow before scheduled operations in April.

The Netherlands' Military Mission contemplates the purchase of airplanes, anti-aircraft equipment, torpedo boats and munitions from this country.

The planes, when purchased, will be delivered to the Dutch East Indies Army Air Force.

Loss of Los Angeles, California, National Guard Airport in Griffith Park looms with the halting of North American's delivery of eleven model O-47 monoplanes and the contemplated removal of the base farther north. Antiquated hangars (World War built) and a small field are the reasons. Oakland appears favored.

Timm Aircraft Corporation of Glendale, California, has purchased the entire assets

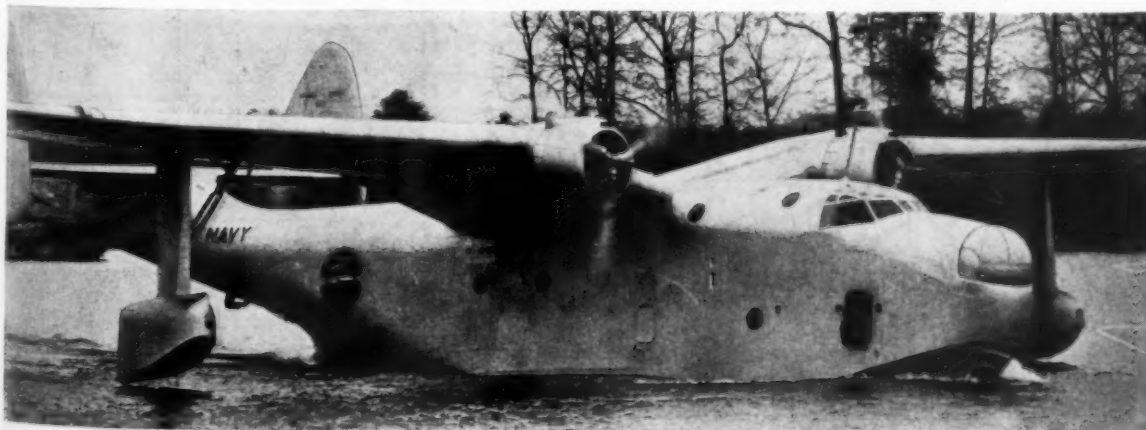


The Fairey "Battle" standing on its wing above the clouds. Speed, 250 m.p.h. (Globe)

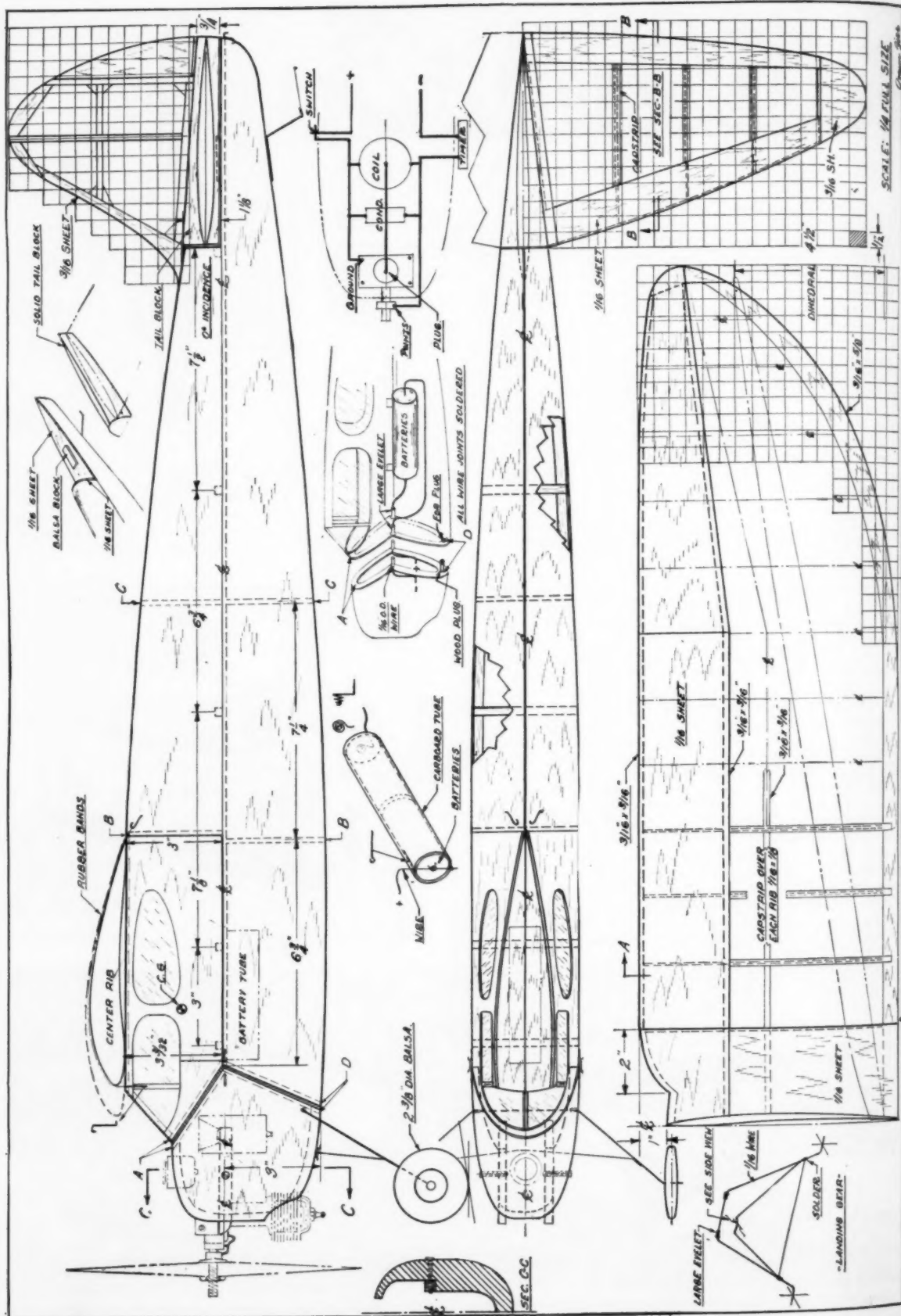
of the Kinner Airplane and Motor Corp. of the same address. Production of improved versions of the once-popular low-
(Continued on page 60)

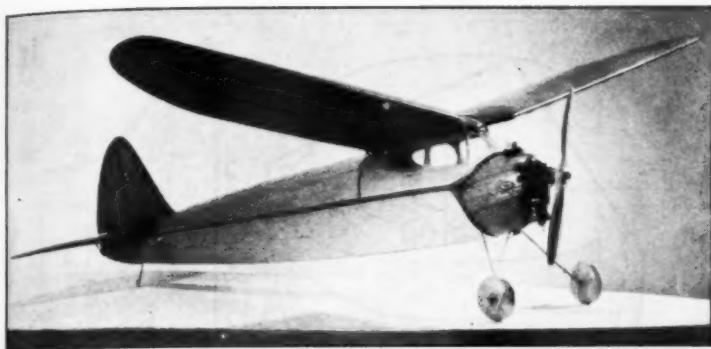


Single seat Grumman F3F-2 pursuits in formation flight. (Official U.S. Navy Photo)

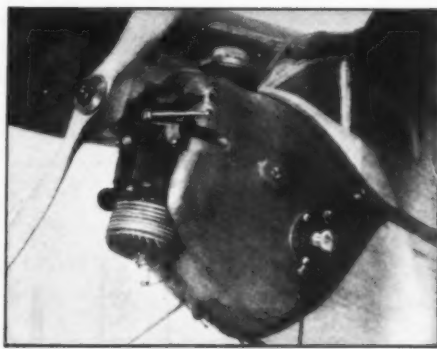


The new Martin 18 ton bombers just completed for the U.S. Navy. (International)





The completed 21 ounce gas model ready to "go places"



A close-up of the nose and motor

**Aerodynamic and General
Structural Design by
CHARLES H. GRANT
Built and Described by
LOUIS GARAMI**

BUILDING THE "BEE"

MANY model builders have been "crying" for plans of a high-performance, small-engine, simply-built gas model. At last we have been able to realize their dream. This little plane probably fulfills these specifications to a higher degree than any plane that has ever been designed.

Complete with the motor unit, ready to fly, it weighs twenty-one ounces. The wing area is 380 square inches. This gives the plane a wing loading of exactly eight ounces per square foot. In the past it has been

nearly impossible to produce a plane with this small wing area and small power which would have a wing loading as light as this. Usually such planes have a wing loading of about twelve ounces per square foot.

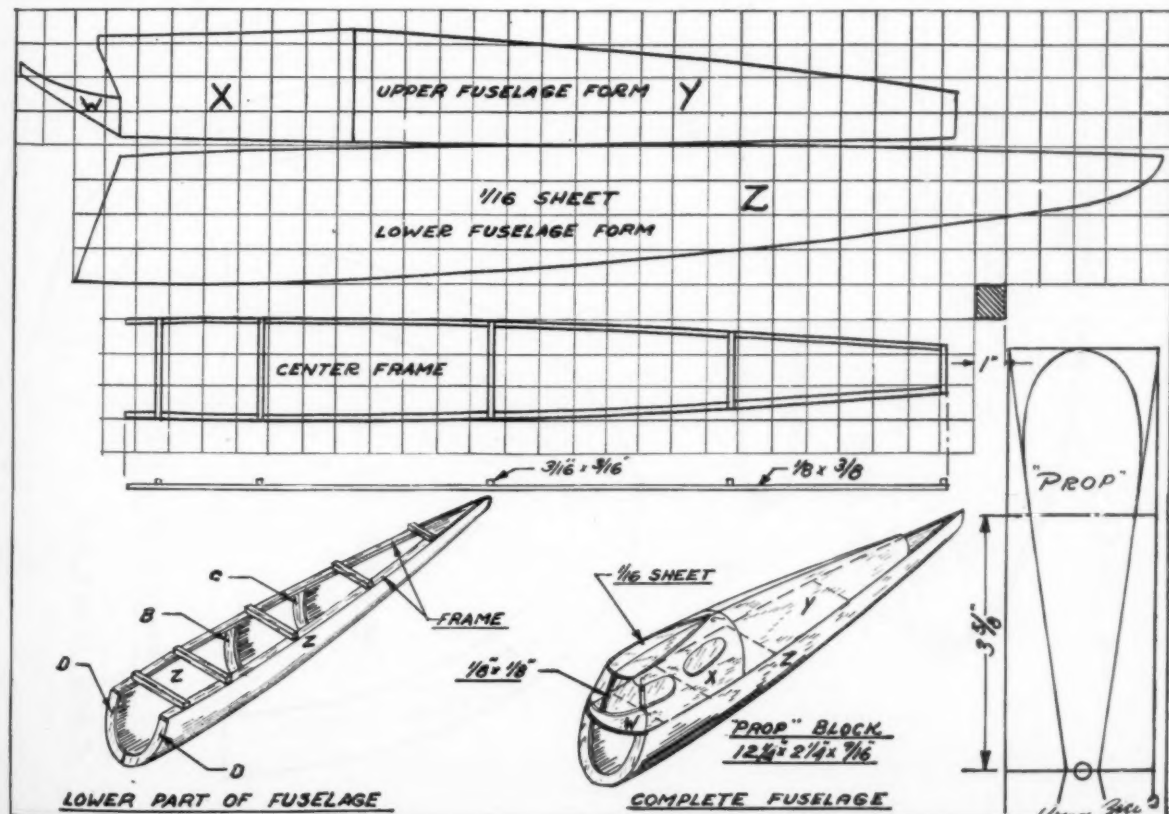
Its efficiency is phenomenal—it climbs in a steady, steep spiral and when the motor stops, flies in a very flat, even glide. The glide is comparable to any large size gas model that has ever been built. This statement of performance is not merely guesswork: It has been thoroughly tested. On one afternoon alone as many as twenty consecutive flights—without one mishap—were made with the little ship.

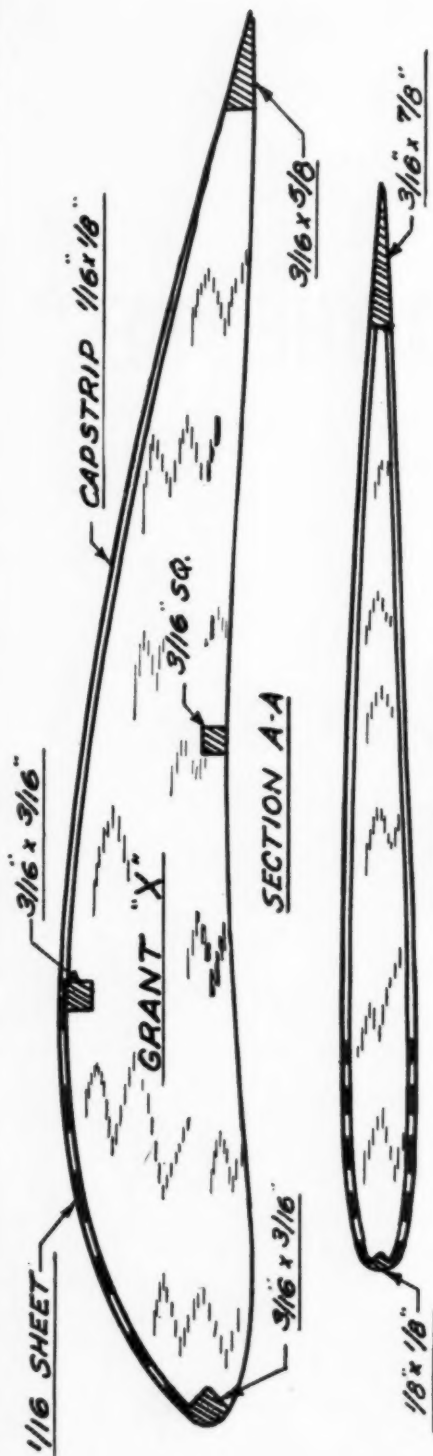
Usually the creation of a plane as small as this requires expert workmanship, due

to its light and complicated structure. However, a view of the plans will give you an immediate idea of the simplicity of the structure of this ship. Basically it is composed merely of two longerons disposed side by side horizontally, with 1/16" balsa sides cemented to them. These sides are then curved over the top and around underneath the ship until they join above and below the longerons. They are cemented together at the joints. This type of construction cannot be surpassed for simplicity and strength.

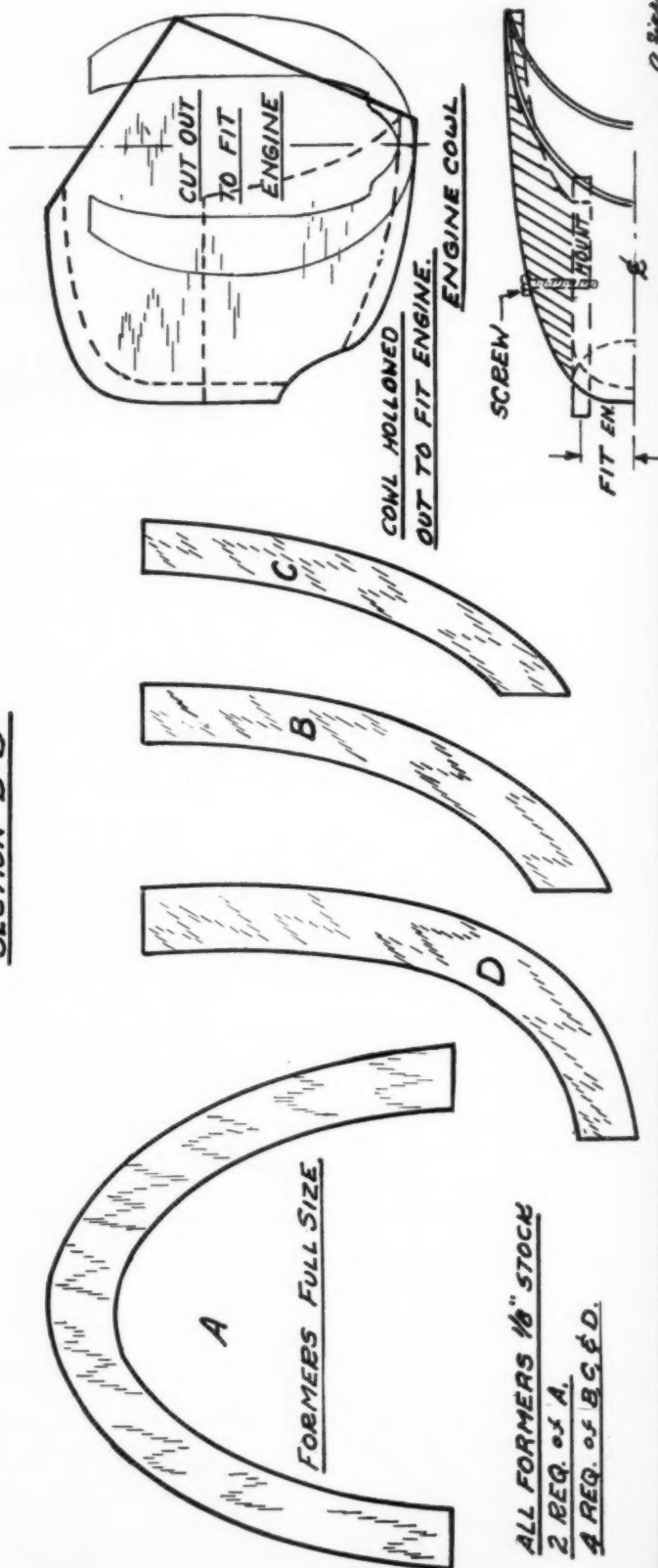
The motor, coil, condenser and tank are mounted as a unit in the nose, which is detachable from the body. The landing gear

(Continued on page 36)





SECTION B-B



The Physics of the Airplane

ARTICLE No. 9

By Lt. JAMES P. EAMES
and WILLIS L. NYE

The Elements of the Machine

EVERY existing form of machinery which we perceive in daily operation all around us depends upon one of the simple types of elementary machines, or perhaps, upon some combination of several of these. The airplane is no exception to this general rule. In fact, the heavier-than-air flying machine incorporates practically every one of the elementary types of simple machine in its construction, being somewhat singular in this respect.

The initial device we concern ourselves with is the lever. This is one of man's earliest known aids, some mention of it being made in history's most antiquated chronicles. An analysis of the principle of the lever shows that levers are divided into three classes. They differ in accordance with the location of their fulcrums, or points of support, as referred to the various forces acting upon the member. A lever of the first class has its fulcrum located between the force applied, which from this point onward in this discussion, will be designated as the "Effort," and the force overcome which will hereinafter be termed the "Resistance." The rocker arms of an aircraft engine are excellent examples of levers of the first class. The standard which secures the assembly to the cylinder head represents the fulcrum. The shorter arm of the rocker beam extends from the center-line of the standard to the push-rod assembly, the longer arm coming into contact with the valve stem. It can be readily seen that a small force applied at the extremity of the shorter arm gives the equivalent of a considerably greater effort at the extremity of the longer member. It becomes further evident that the amount of force exerted at the extremity of the longer arm will be proportionate to the applied force by an amount equal to the

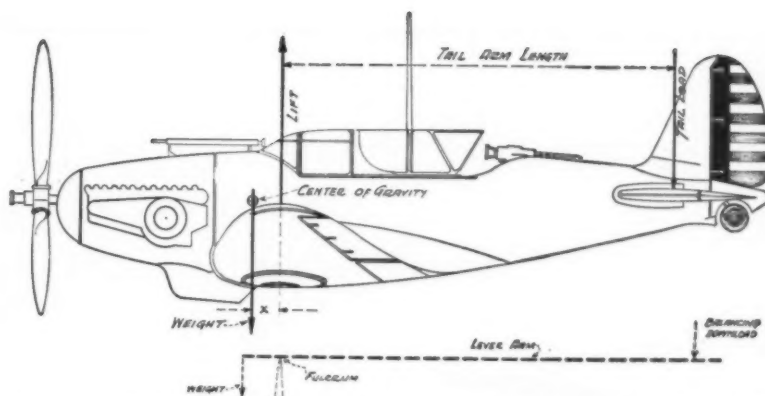


Figure 1. Airplane structure as an example of a balanced lever with mechanical equivalent shown below. (U.E. Air Corps Consolidated PB-2A)

ratio of the lengths of the lever arms. This condition is expressed by an engineering quantity termed the "Moment of Force." This quantity is defined as the product of the force and the perpendicular distance between its line of action and the axis of rotation. A simple illustration should tend to clarify the wording of the definition.

The length of a rocker arm of a liquid-cooled, in-lined aircraft engine from the center line of the push-rod to the center line of the central standard acting as the fulcrum is 1-1/2 inches. The length from the standard to the center line of the valve stem is 2-1/2 inches. A force of 60 pounds is applied by the camshaft and is transmitted through the push-rod assembly. Find the force R which is developed to overcome the valve spring pressure. By applying the simple principle of moments:

$$F \times 2-1/2 = R \times 1-1/2$$

$$60 \times 2-1/2 = R \times 1-1/2$$

$$R = \frac{150}{1.5} = 100 \text{ pounds}$$

The foregoing problem brings out the fact that the moment tending to produce clockwise rotation of the rocker arm (rotation in the direction similar to that followed by the hands of the clock) is exactly equal to the moment tending to produce counter-clockwise rotation in the member, or, in other words, our lever or rocker arm is said to be balanced; the above condition satisfying the requirements of the "Law of the Lever" which states that the forces applied to a balanced lever are inversely proportional to their distances from the fulcrum. A simple application of this law is shown by the drawing of Figure One. Here a military airplane assumes the attitude of normal

flight, and, as we recall from our initial study of aeronautical physics, the weight force equals the lift force for this condition. Then, taking the moments about the center of gravity of the structure:

Tail Load \times Tail Arm = Lift Force \times Distance X.

Note: Distance X is known as the Moment Arm of the Center of Gravity. This condition being satisfied, the airplane is noted to be in perfect balance.

Obviously, the lever is used as a mechanical device in airplane construction in order that the designer will obtain a certain advantage through its incorporation in the structure. At first sight, it appears as though there exists an increase in the work performed by the machine over the original effort that is applied. However, the law of conservation of energy makes this attainment impossible of achievement. The work done on the lever, or in the same manner, on any type of machine, must always be the same as the work done by the machine, neglecting friction for the moment. The machine has merely made it possible to exert a large force through the application of a small force; the total work done by each force being equal because of the variation in the distances through which they are acting.

The ratio of the large force to the small force is designated as the "Mechanical Advantage," and is defined "as the ratio of the resistance of the force overcome to the applied force." The actual mechanical advantage will always be less than the ideal value by the amount of the friction involved.

For instance, let us calculate the mechanical advantage involved when the pilot of a large bombardment airplane imposes a force of, say 300 pounds, upon the control surfaces of the craft. Assume that the length of the central control column is 2-1/2 feet, and the distance from the pivot or the fulcrum, to the point of attachment of the control tubes is 6 inches or 1/2 foot. This leaves the remaining length of the grip of 2 feet. The pilot actually exerts a force of 75 pounds on the control column. As an example:

$$\text{Mechanical Advantage} = \frac{\text{Force overcome}}{\text{Force applied}} = \frac{300}{75} = 4$$

Checking this value by the application of
(Continued on page 30)

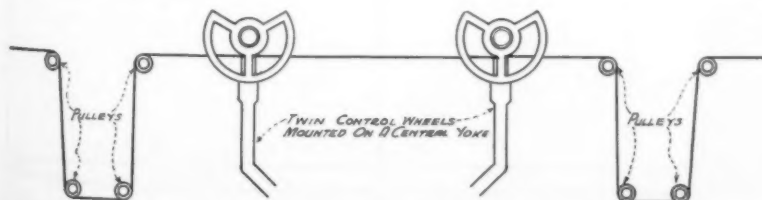
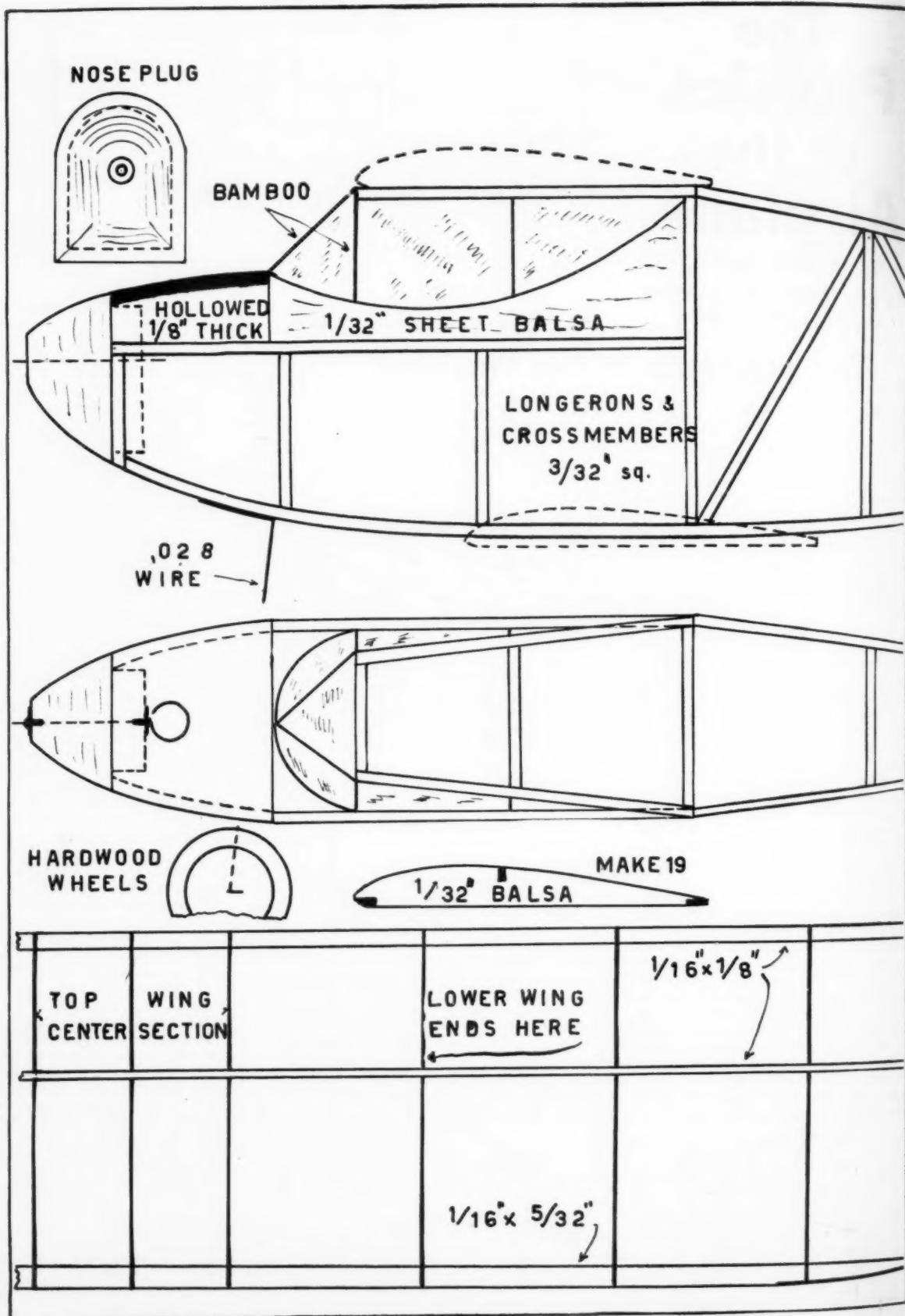
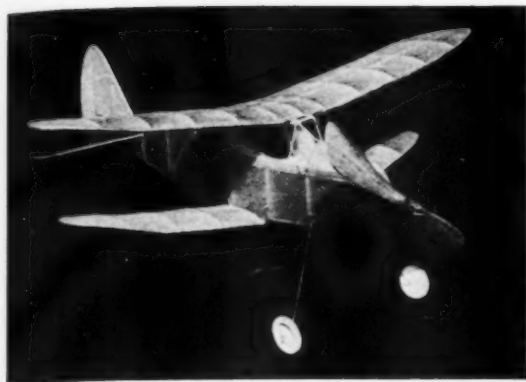


Figure 2. Control system for a large airplane.





A semi-scale ship with contest performance

By LOUIS GARAMI

“WHEN your model building activity is taking a nose-dive, as a result of too many monoplanes, a pull-out is readily accomplished by switching to a biplane.” (Model Butcher's Handbook. Advice No. 444.)

So, here it is fellows. Just what the doctor ordered for ailing ambition, rusty razor blades, and dried-up cement.

Although it is small in size and easily built, our biplane is a “big” performer and an extra good looker. It has the “umpf” of a full size model, due to the large propeller employed, while the light-weight construction and adjustable wings pave the way for a better glide and crack-up-free performance.

And now, if we still haven't sold you the idea of building this handsome fly-by-day or night, let us whisper into your ear: Yep, it “takes off” from the ground too . . .

Body and Propeller

The longerons and cross-braces are of 3/32" square medium hard balsa. Both sides are made together, one on top of the other. First pin the bottom longerons on the plan and see if they will take the sharp bend of the front without cracking. A few seconds of soaking in hot water will surely soften them up sufficiently to do the trick but they have to be dry before further work can be done.

The top longerons follow next and with the cross-braces glued in place the whole thing is left to dry.

Separate the two sides with a razor blade and cement the top and bottom cross-braces in their position. Naturally the cabin roof is left alone until after the nose is finished. When the soft balsa block, 1-1/2" x 1-5/8" x 5/8", carved into shape and hollowed out is glued on, the top cross-brace of the nose can be removed to allow a full opening. Next the two sheet balsa window shapes are cemented in position and the cabin top built. Make sure that the cabin roof is parallel to the middle longeron because the top wing incidence depends on it. By varying the length of the bamboo supports this is easily accomplished. For windows we prefer celluloid to cellophane because it strengthens the body around the cabin.

Next the noseplug is made out of two pieces. First the 1/4" piece is made to fit

into the nose and glued on a block of balsa 1-3/8" x 1-1/8" x 5/8". Then this outside piece is finished off with a knife and sandpapered.

For bearings use large copper washers with small bushings in them. Make sure that the hole in the noseplug is straight in every direction. The one piece landing gear is bent out of .028 wire and glued on the

down and the ribs cemented on 1-1/2" apart except on the center section. (See plan.) A 1/4" wide bamboo bent above the gas flame is sufficient to make the four tips. Slice them off with a sharp knife. To make the dihedral, cut in (not all the way through) the leading and trailing edges next to the center section rib. Now cut the top spar all the way through and take a 1/32" slice out of it. Reglue these three points with the wing tips raised one inch.

The lower wing is made in two halves. It is exactly the same as the top wing but one section shorter. The two halves are pinned to the body, right where their position is shown on the plan, and a sheet balsa center section is fitted between them. Now the three pieces are reassembled on the work bench to the proper dihedral and cemented.

Use a soft 1/16" sheet balsa for the elevator and rudder. The rear part of the rudder is sandpapered thin so that it will stand the necessary adjustments without breaking.

Cover the entire framework with colored tissue, using light dope for adhesive. Leave an open section on the bottom of the body right below the rear hook. Spray the tissue lightly with water. When dry apply a coat of light dope or banana oil.

Attach the tail surfaces to their proper positions, making sure that the two halves of the elevator are set at the same angle of incidence. For power use six strands of lubricated brown rubber. The wings are attached to the body with thin rubber bands.

(Continued on page 28)



Of simple construction, easily built

bottom of the body. Use one inch hardwood wheels, not balsa; otherwise the balance of the plane will not be right.

Carve the propeller out of a medium hard block. Give 1-1/6" inside camber then carve the outside so that the thickest part is about 1/8". Finish off with sandpaper, balance and insert the same bearings as in the noseplug. Any reliable free wheeling will improve the glide tremendously. So, make up your mind to use one if you did not use one before.

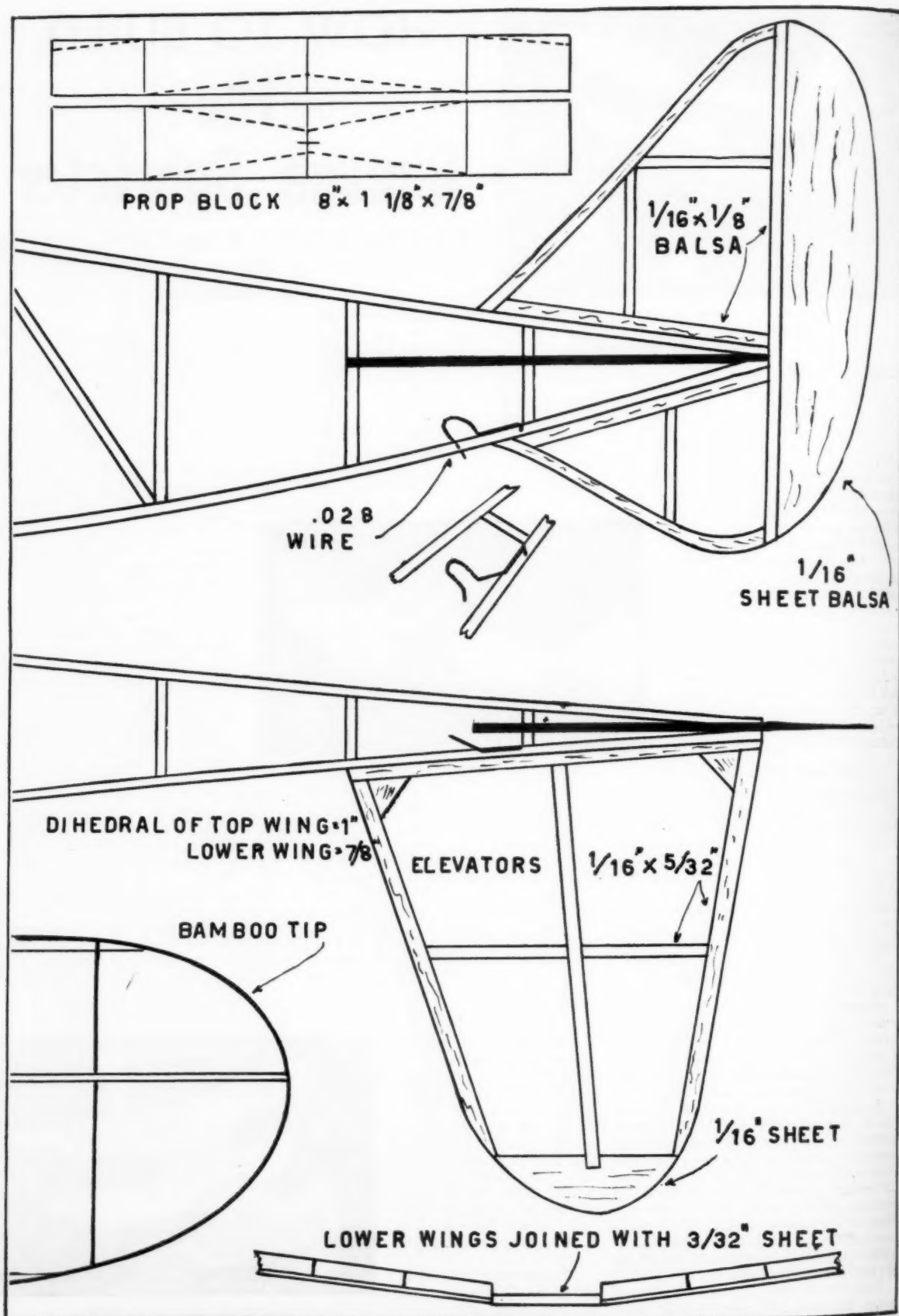
Wing and Tail

The nineteen ribs can be cut out either separately or in a block. Pin together nineteen slats of soft 1/32" balsa, size 5/16" x 2-3/4". Shape the resulting block into the correct airfoil with the aid of a sharp knife and then sandpaper the block. Now cut the spar notches with a razor blade and you will have saved at least thirty minutes of labor.

The top wing is made in one piece. The leading and trailing edges are pinned



Large tail areas give stability



Air Ways



Pict. No. 1. A Curtiss Hawk by Ed Oates. Fine workmanship here!

MODEL aviation seems to be feeling the effects of spring. Many workshops with walls bulging with new ideas, generated during the winter months, are nearly ready to burst forth into aeronautical bloom. This seems to be an annual state of affairs. . . . Most model builders make use of poor flying weather to think up and create aeronautical contraptions

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World

that may ride the wings on balmy spring days. Many readers are looking forward with expectation to see what his neighboring model-building friend will bring forth in the nature of aeronautical devices. Therefore if you have any unusual creation which has been taking form under your expert touch, send a picture with a description of its unique features to "Air Ways." This will help to satisfy the curiosity and intrigue the interest of other readers.

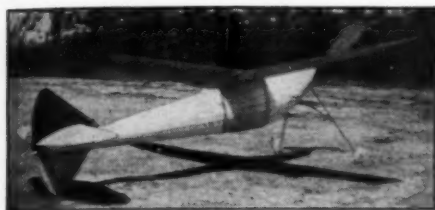
Though new ideas are always interesting, the old standard practice of building beautiful scale models never seems to fade. Picture No. 1 shows an excellent example of this type of work. It is a Curtiss Hawk built in great detail by Edwin L. Oates of 52 New King Street, Thompsonville, Conn. We are interested and really pleased to see that Mr. Oates has made this model of white pine. Those who have not made models with this type of wood do not realize the advantage in respect to finish that may be

obtained, and the accurate details that may be carved in the hardwood surface. Balsa, being of coarse grain and such a type wood that is easily crushed, it is difficult indeed to get the refinement of detail imposed upon its surface in a proper manner. Examination of the picture will indicate the fine workmanship employed in this model's creation. The detail of the engine, propeller and other parts is well carried out. Wing ribs and fuselage stringers are imitated by cementing on paper strips before the final finish is applied. The cockpit contains all the details of a big ship; instrument panel and complete controls. Propeller blades have been filed from aluminum rods then polished and buffed to a bright finish.

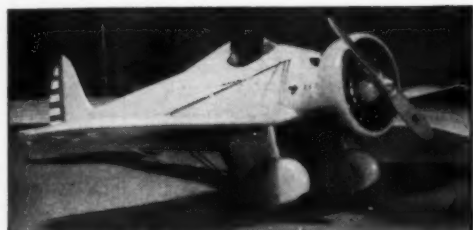
Not only is the model a fine piece of work, but the photography is excellent. We might suggest that others follow Mr. Oates' procedure if they wish to obtain fine photographs. This picture was taken indoors without the use of any other artificial light; the model being posed on a box covered with light brown wrapping paper. This paper also formed the background. A Zeiss Maximar camera was used with the lens stopped down to F22, and an exposure of ten seconds employed. Mr. Oates says the model represents over two years of intricate work. He is a member of the Springfield Model Airplane Club, of which Mr. Ernest Walen is director.

Another fine example of scale model work is shown in picture No. 2. It is a Boeing P-26, built by LeRoy Erickson of 6503 Leighton Avenue, Lincoln, Nebraska. The motor is built up of disks of celluloid and it has about 570 pieces in it. The fuselage was built up, filled with balsa and then silk covered. The wheels are turned from solid aluminum and the cowling is of walnut. Very often on

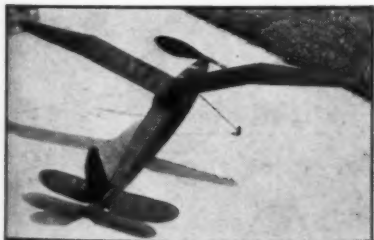
(Continued on page 55)



Pict. No. 3. A Wakefield model that has flown for over an hour, by Lawrence Faulkner



Pict. No. 2. Another detail scale model, a Boeing P-26, of which the builder, LeRoy Erickson, can be proud



Pict. No. 4. A very stable and efficient contest model built by Joe Walsh



Pict. No. 6. A "Gas Hen" with her brood, ready for eventualities, by Arthur Ish



Pict. No. 5. Believe it or not, this is a real flight picture. "Consistent" is this ship's first name

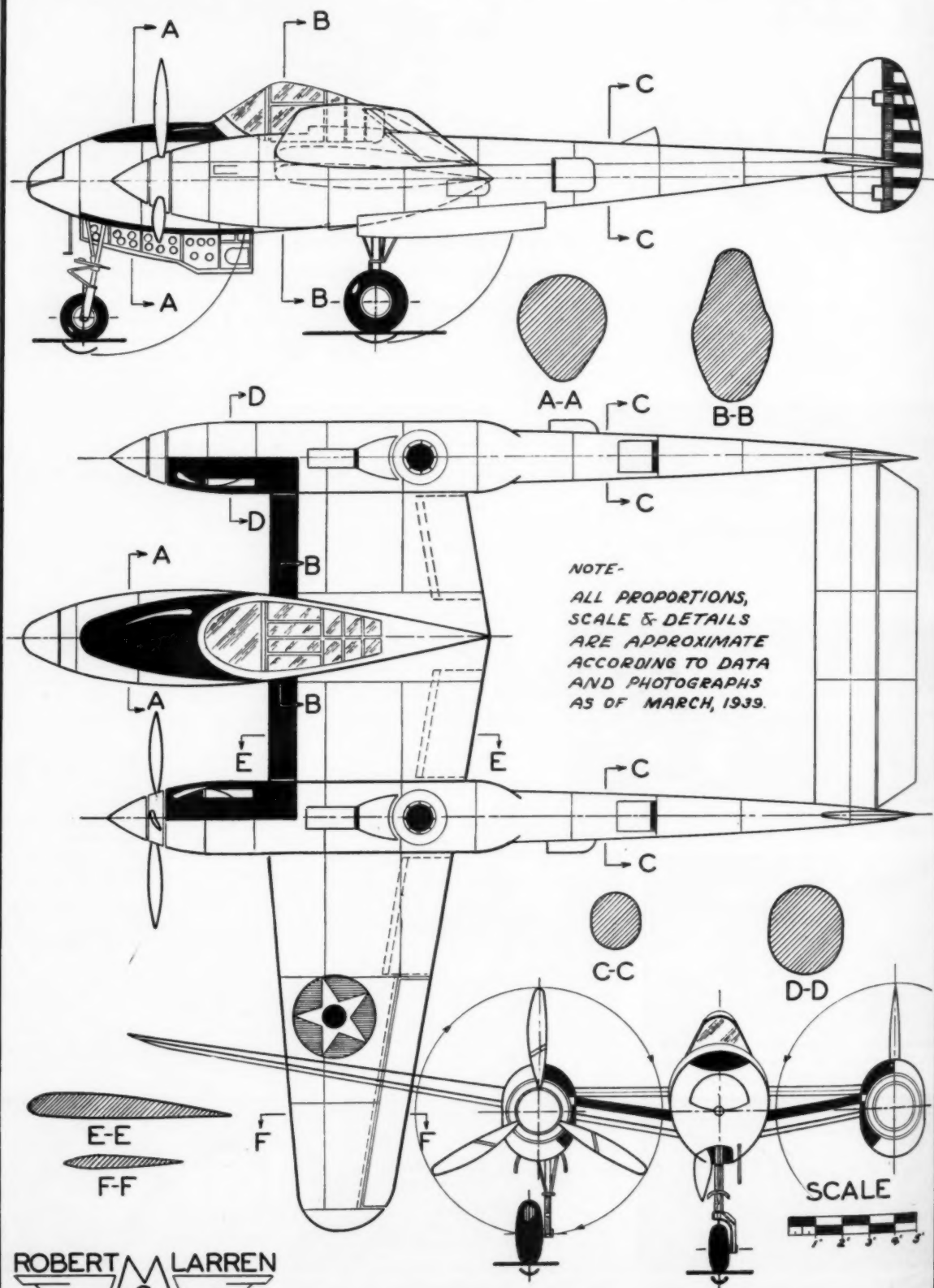


Pict. No. 7. A scale model of a late type Fokker pursuit plane G-1, by A. Warnaar



Pict. No. 8. A German builder and his Heinkel He-70 with retractable gear

LOCKHEED XP-38 PURSUIT "WORLD'S FASTEST FIGHTER"



BY
ROBERT McLARREN

LAST month we were able to give you exclusive scoop coverage on the most astounding fighting airplane ever developed, the Lockheed XP-38, which startled military and political circles throughout the world. In the past month several new and interesting details of this sky terror have come to light which further reveal the amazing strength and power of this craft. After its breath-taking coast-to-coast dash during which it hit a speed of 420 miles per hour on short stretches it came to rest, though damaged badly, on Long Island's swanky smart-set golf course adjacent to the U.S. Air Corps' Mitchel Field, Eastern terminus of the flight. Cause of the crash: "Man Failure," states Colonel James Chaney, Commanding Officer.

Lieutenant Benjamin S. Kelsey, pioneer air corps test pilot, touched earth after his hair-raising flight a frenzied and incoherent pilot. Held in military seclusion at the palatial New York residence of Colonel Keith Simpson, he was shielded from all messages and calls, an armed guard patrolling the estate's high outer gate. Known facts were his severe lacerations which were tended by able military physicians. His head and face badly cut. His legs were slashed and sprained. These things are the result of any bad crackup. Close-lipped medicos, silent under a barrage of news-reporters' questions, released one salient fact: "Lieutenant Kelsey is suffering from extreme nervous shock not a direct result of the accident!" Air Corps officers refused to enlarge on this clipped revelation. The doctors were severely chastised and placed under guard during visits to the bed-ridden test pilot. All of which leads us to the question: What aspect of that nerve-shattering flight caused this shock; why were Lieutenant Kelsey's remarks after the crash little more than meaningless babble? Colonel Ira J. Justian, Medical Corps, long-time associate of the air corps states: "The Lock-

The **BOMBER CATCHER**

The Plane on the Cover

heed XP-38 as a military weapon is without peer among the nations. It is the fastest and most potent fighting machine ever created. But, unfortunately, its operation at full throttle over extended periods will be a physical impracticality for no flying officer will be able to withstand the amazing acceleration, high speed and mental problems the ship presents."

Here then is an air corps flying doctor injecting a new aspect into this startling new ship. The Lockheed XP-38 has a top speed of at least 420 miles per hour, or roughly 615 feet per second! This means that in one second, the sheer snap of a finger, this monster has hurtled over two hundred yards through the air. And this means, further, that its pilot must sit within that tiny cabin on the tinge of insanity throughout its operation at high speed. Why? Here's the answer as advanced by medical text books.

Man's responses and reflexes are far from instantaneous. His eye must first see a set of conditions. (An approaching airplane veering into his line of flight; a rugged mountainside crag.) After proper focus and reception of this image it is flashed to the brain center. Here the mind's past experience, logic and thought-ability are brought to bear in interpreting that photograph and becoming aware of its meaning. Next must come the brain's decision. This may consume a portion of time from the most infinite part of an instant to as long

as five or six seconds, according to the subject's responsive powers. Next must come the relaying of this message to the fingers, toes and eyes and the resultant flexation of suitable muscles. Now then, in the average human being, even the most expert military pilot, this process has taken at least 1½ seconds. In the case of an airplane pilot, inertia of the control gear and exposed control surfaces will consume another half-second. And finally, the actual change of course as brought about by the alteration of the control surfaces in the airstream will most surely take another second to develop, sometimes five or six seconds in the case of commercial planes.

Now what does all this mean? Simply that from the first sight of danger; an obstruction in his flight path, something amiss with his plane or its engines, anything untoward for that matter, to the time the path of flight has been actually changed will take a minimum of three full seconds. And in that time this, the world's fastest pursuit plane, will have traveled 1,845 feet, well over ¼ MILE! This in the normal course of a pilot's human faculty of reaction. Augment this with the time it would take to actually pull this roaring aerial beast out of its line of flight and into either a bank, climb or dive and you have the real reason for pilot Kelsey's nerve-shocked condition at the end of that seven hours, forty-five minute flight.

(Continued on page 28)

A Word to the Wise

Sportsmanship in Aviation

DRAG UP an asbestos chair, students. Are we burned up! You'll recall last month we enumerated the various benefits accruing from your participation in this fascinating hobby of model airplane building...

Well, one of those "always belittling" guys stopped us to say, "All well and good, but look what these aeromodelists are missing! Consider the sportsmanship angle of such activities as... baseball, for instance."

Now, don't misunderstand us, chums, we think the national pastime is a grand sport and we strike out with regularity and vigor ourselves. But for anybody to infer model building doesn't teach sportsmanship...! Boy, did we tell him:

There's no better teacher of honest-to-goodness sportsmanship than model airplane building and flying. Did you ever see two

chaps competing in a chess tournament for a trip to Europe assist each other with the moves? But you saw it last year in our Wakefield trials. Contestants at a model plane meet are always helping each other wind and adjust their entries.

Did anyone ever see rivals help each other start their racing cars on the Indianapolis Speedway? No, sir, but at any gas contest you'll note contesting entrants assist one another in starting their motors!

Sportsmanship, did you say?

Model airplane building is permeated with it: nowhere have we ever seen those who lose accept defeat with such good grace and congratulate the victors with such sincerity! An example: To our national contest comes a chap from California, another from Flor-

ida. The West Coast entrant breaks his last spark plug and the first to offer another is the Florida fellow. So what happens? The California flyer sets a new gas record... certainly Florida should come in for a credit line there!

That's no isolated example. It happens at every meet—in East Seekonk as well as in Tulsa. And you'll find it in few other amateur sports... it's the most amazing phase of our competitions and the one spotted first by sporting experts when they see a modelplane meet for the first time.

And we think it's swell!

We'll bust the first guy in the nose who says it ain't!

(Ed. note: Now isn't that a fine sporting attitude!)

Brought to Your Attention By "THE INSTRUCTOR"



The new North American NA-50 export pursuit plane. The speed is 275 m.p.h. with 875 hp. engine

AT THE Los Angeles Municipal Airport last month appeared a small, stubby single-place pursuit plane ready for its first test flight. It was none other than North American's NA-50 all-metal ship built for export. Pilot Louis Wait took the plane up in a gusty wind and it performed remarkably well.

Powered by a Wright R-1820-G3 engine developing 840 hp. at 8700 ft. the plane has a top speed of 275 m.p.h. Cruising speed at 62.5% horsepower is 250 m.p.h. while landing speed is 67 m.p.h. Rate of climb is 2,200 feet at sea level and an altitude of 10,000 feet may be reached in 4.5 minutes . . . service ceiling being 30,000 feet! Nineteen pounds of oxygen equipment located in the pilot's enclosure makes the cockpit livable at the high altitudes. The gross weight is

5400 pounds and useful load is 1236 including 170 gal. of fuel. This affords a range of 1000 miles at 62.5% horsepower. Maximum range at most economic speed is 1,650

Dimensions are: Wing span—37'; Length—27' 4 1/8"; Height—8' 9"; Propeller diameter—9'; Wing area—230 sq. ft.

In the nose is a Hamilton-Standard con-

FRONTIERS OF AVIATION

miles. For a plane of its size it has the high wing loading of 23.5 pounds per square foot with a power loading of 6.43 pounds per square foot.

stant speed propeller, and with this and 875 hp. for take-off the little airplane hops right into the air. Adopted from North American's fast-going NA-44 attack dive-bomber construction, it is all-metal. The wing is of the usual full cantilever, single spar design, but the fuselage is unique in that it consists of chrome-moly steel tube construction as far aft as the rear of the pilot's seat and then monocoque metal structure is employed from there aft. All movable tail surfaces are fabric covered to insure lighter control.

Of special interest are the wing tips which are said to cut down construction costs and improve stall characteristics. Please note our brief discourse on stub wing tips in last month's article in regard to the Messerschmitts, et al. The wing tips on this airplane are also of the "stub" type, and the continued use of these will prove their success. They appear to be very



The I.M.A.N. Roma 3F, a first-line Italian observation plane



The Avion S-47, first line French high speed pursuit plane. Note the camouflage



The Koolhoven FK-58, a single place Dutch pursuit plane. The high speed is 312 m.p.h.

adaptable for the NA-50. Split flaps are used at the trailing edge of an N.A.C.A. "22" series airfoil. The landing gear is of course retractable.

Other equipment consists of two para-

The Morane 406, first-line French pursuit plane. It has a speed of more than 300 m.p.h. (Hollander)

By ROBERT C. MORRISON

chute flare racks, an R.C.A. radio, a 15.5 gal. oil tank, and the armament is as follows:

Two 100 pound bombs or five 30 lb. bombs, two 7.65 m/m Colt fixed synchronized guns (500 rounds each) and North American designed flush-type bomb racks.

In general appearance the airplane is very graceful and has a pilot's enclosure much resembling that on the Curtiss P-36. It is a very practical airplane in respect to durability, maintenance and performance. Several have already been sold. This marks North American's fiftieth successful design.

A comparable airplane to the NA-50 is the Curtiss-Wright CW-21 interceptor fighter in that it is also a contender for the export market. Specifications follow:

Wing span—35 ft.; Length—26' 6"; Height—9' 9"; Top speed—reported as 300 m.p.h. at 17,000 ft.; Cruising speed—270 m.p.h. at 17,000; Landing speed—68 m.p.h.; Service ceiling—35,500; Cruising range at 500 b.h.p.—630 miles; Rate of climb—5,000 ft./min.; Weight empty—3050 lb.; Useful

load—1042 lb.; Gross weight—4092 lb.

The power-plant is a Wright Cyclone R 1820-G5 rated at 1,000 hp. at take-off, 750 hp. at 15,200 ft. and 850 hp. at 6,000 ft. One special item of particular note on the airplane is the inch-thick armor plating in the rear of the pilot's seat to protect him from enemy bullets.

There is plenty doing these months in regard to pursuit planes and our newly touted interceptors. Curtiss, Seversky and Bell were the only bidders on single-engined one-seat pursuers in bids opened January 25th. Though Curtiss was much the low bidder, it looks as though Bell has a good chance, for in the large quantities Bell's price closely approaches Curtiss'



The Loire 45, one of the latest twin motored French bombing planes. Note the dihedralized stabilizer. (Model practice)

in spite of the fact that the Bell is a completely new design and radical at that. We have not as yet found out much about Seversky's entry, but it must be top-notch considering the high price they want for it. The

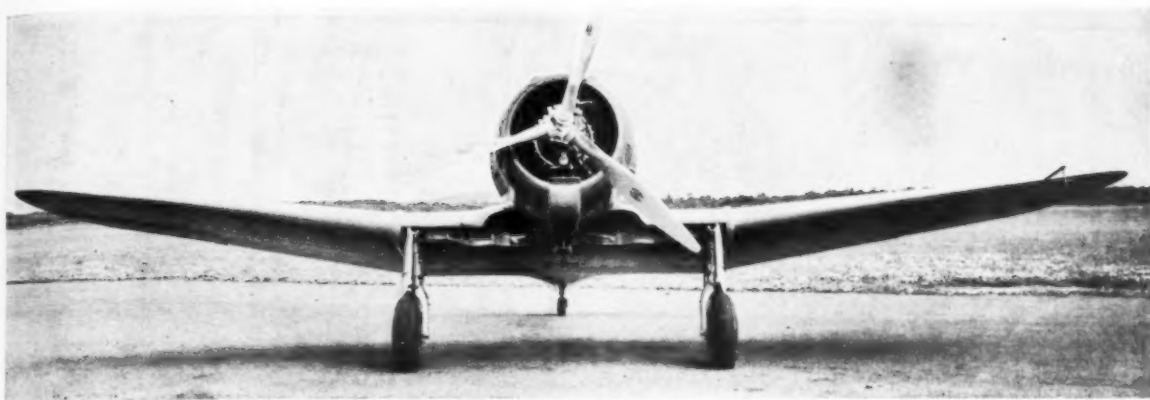
(Continued on page 38)



The new Kellat direct control autogiro. The high speed is 125 m.p.h. (Globe)



A new four motored German transoceanic flying boat, the Dornier Do-26. Hinged sections of the wing form the wing floats



The Chance Vought V-143 pursuit low-wing monoplane. The landing gear wheels are clearly visible

A Pursuit Plane In Miniature

Here's What the Scale Model Builders Have Been Looking For—Complete Detail Plans and Instructions to Build a V-143 Vought Pursuit Monoplane

THE "V-143" Chance Vought pursuit monoplane is one of America's finest example of clean airplane design. It is built by Chance Vought Aircraft, a division of the United Aircraft Corporation, at East Hartford, Connecticut. It is powered by a Twin Wasp Junior, Model "SB4-6," with horsepower ratings of 750 at 2550 R.P.M. at 9000 feet altitude and 825 H.P. at 2625 R.P.M. for take off. Plans on this engine will be published in a later issue and it is suggested that the builder build his dummy motor from these plans. Details on the rivet's centerlines, both lengthwise and crosswise on the wings, fuselage and tails are unobtainable. Also, due to stringent regulations, data on the landing gear mechanism is also unobtainable but word informations say that it is hinged on a pivot, which is connected to an electric motor by pinion gears. Also the motor is operated by a switch in the cockpit. The rivets are of flush type, about 1/4" diameter. All secondary measurements outside of the main specifications such as span, height and length overall were scaled from the original factory three-views. They were put on the plans to aid the modeler in redrawing up his plans. The drawings as shown on the General Arrangements Plan (Plate No. 3) were drawn to aid builders in building the entire internal details in correct proportions to the scale. Nearly all military airplanes in the United States military services are equipped with hanging pedals, standard type pilot seats and controls.

It is suggested that all model builders should redraw up their airplane plans for several reasons. First, after the modeler finishes the plans, he will understand the

entire airplane design better than by following somebody else's plans. Second, the ability to read fine drawings and blueprints is an asset to anybody wishing to enter the aviation industries; either as a mechanic, skilled workman, metal worker, machinist, draftsman or as an aviator. One way or another, persons connected with the aviation industry come in contact with blueprints and the subject must be grasped without spending any excessive amount of time. So the best method of the ability to read blueprints is to learn by doing. Aeronautical drafting is a fascinating game to those interested in aviation so we are giving some points on drawing up the plans in three-view form like they do at the factory.

Redrawing the V-143

Before you start to draw your plans choose the scale that you wish to build your model. Use this scale and measure up the span, height and length overall of the V-143 and secure a sheet of drawing paper that will allow the drawing of the three-view outline in standard "L" shape layout plus a few inches more for margins (top view in upper left-hand corner, front view below the top view in line with the top view's center line; the left side view in the right side corner in line with the front view's horizontal center-line). After you are sure that the paper is large enough for the drawing of plans to your chosen scale, attach the paper to the board. It is best to draw a border equal distances from all sides, say 3/4" margin. Now measure the space (height and length) inside the border and make a note of it. Now refer to Plate No. 1 and scale the three main dimensions outside the

By WILLIAM WYLAM

border in order as listed: Length of top view and height of front view on left side (outside of border); and span of front view and length overall of side view underneath the border-line. On the left side space outside the border-line measure up in inches the height and length, then add together. Subtract the result of the addition of the length and height in scaled distance from the height of the space inside of the border, divide the results by three and this will give you the clearance of all the even spaces; i.e., the height of the ground line from the border, the distance from the top of the tail to the leading edge of the propeller and the space between the rudder and top border line.

Use this same procedure on the front view and the left side view; by adding up the scaled distance in inches of the span and length overall, subtracting the results from the lengthwise size of the space inside the border, dividing the balance by three for the clearance of the left wing tip and left side border-line, the distance between the right wing tip and leading edge of the propeller, and the space between the rudder and the right side border-line. Draw all these clearance lines very light with the exception of the ground line on the front and left side view, which should be as heavy as the drawing itself.

Now draw the center line of the top view right down to the front view, making sure that it is in true center and make the line very sharp. Refer to Fig. No. 6A for the height of the thrust line and make this scaled distance up from the ground line on the top view's center line. At this point draw the horizontal center line right across the entire page; parallel to the ground line. Refer to Fig. No. 2 and draw the entire engine cowl, machine gun housings and propeller. Refer to Fig. No. 6 and draw the entire front wing layout. Refer to Fig. No. 6A and lay out the center line of the propeller before drawing it. Lay out the line parallel to the propeller's center line; that is, the scaled distance from the propeller's center line to the leading edge of the wing. Using the specifications shown on Fig. No. 6A, draw the wing by projecting lines

(Continued on page 33)

CHANCE-VOUGHT AIRCRAFT PLATE 11 **V-143** SPECIAL LAYOUT SECTIONS DRAWN BY WAWYLAM

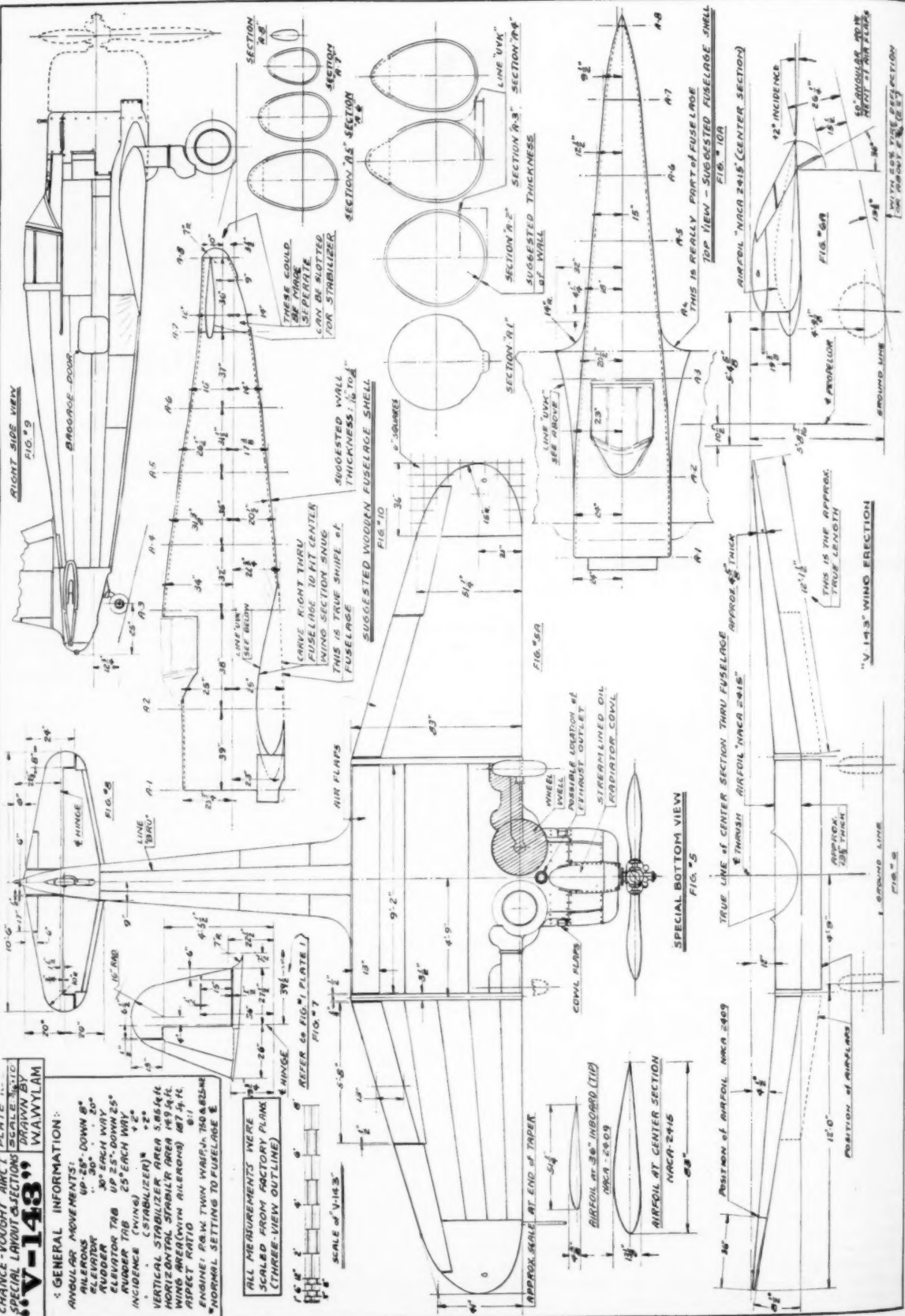
GENERAL INFORMATION:

ANGULAR MOVEMENTS:
 ALERONS UP-25° DOWN 8°
 ELEVATOR 30° EACH WAY
 ELEVATOR TAB 25° DOWN 25°
 INCIDENCE (WING) 12°
 (STABILIZER) 2°
 VERTICAL STABILIZER AREA 5.85 sq ft
 HORIZONTAL STABILIZER AREA 149 sq ft
 WING AREA (WITH ALERONS) 187 sq ft
 ASPECT RATIO 6.1
 ENGINE: PAW TWIN WARP 700 BHP
 NORMAL SETTING TO FUSELAGE 1°

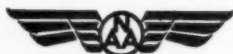
ALL MEASUREMENTS WERE
 SCALED FROM FACTORY PLANS
 (THREE-VIEW OUTLINE)

REFER TO FIG. 1 PLATE 1

SCALE OF V-143



National Aeronautic Association Junior Membership News



Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

A form containing details about the new gas model insurance and an official application will be sent upon request. Send a card to the National Aeronautic Association, Dupont Circle, Washington, D.C., stating whether or not you are a member of the N.A.A. Gas Model Division, and you shall receive your copy immediately.

1939 WAKEFIELD RULES HERE!!

N.A.A. MODELERS will be glad to learn that the revised Wakefield rules for 1939 have been received from England. The rules also will govern the Wakefield Elimination Event which will be held at the 1939 national model competition in Detroit. It is probable that an even greater interest than usual will be taken in Wakefield models this year, due to the fact that the International Event will be held in the United States in 1939 because of America's victory at the 1938 Wakefield International in France. The new rules are:

1. The competition shall be open to all nations whose teams shall consist of not more than six individual competitors.

2. The contest shall be for fuselage rubber-driven models, the rubber motor or motors of which must be enclosed, and the fuselage, or fuselages, must be fully covered and conform to the following formula:

$$\frac{L^2}{100} = \text{Minimum area of the maximum cross section.}$$

—where "L" equals overall length of model.

3. The following conditions must be complied with regarding the area of the surfaces and the weight of the model.

a) The total area of the main plane, or planes, to be 200 sq. ins., with a plus or minus tolerance of 10 sq. ins. The area being the actual plan area of the cambered surfaces, measured on the chord line without allowance for dihedral angle or polyhedral angles, etc.

b) The area of the tail plane shall not exceed 33 per cent of that of the main plane or planes.

c) No model shall have a total weight of less than eight (8) ounces.

4. The models, including the propellers, must be constructed by the entrant. Gearboxes, when used, must also be constructed by the entrant with the sole exception of the gearwheels.

5. No part of the model shall become detached during its flight.

6. The competition shall be for duration of flight.

7. Each model must rise from the ground from a standstill, entirely under its own power, transmitted by the propeller or propellers, and no push is permitted. Models when starting may be held only by the propeller or propellers and by the wing tip.

Holding the model for release by any other part shall lead to immediate disqualification from that round.

8. The timing of any flight shall terminate when the model touches some solid object or passes out of sight of the timekeepers, the timekeepers remaining at the point from which the machine is released.

Two officially appointed timekeepers must be employed, each having an approved stop watch. The mean value of the readings of the two watches to be taken as the actual duration. No optical device such as binoculars, telescopes, colored or tinted glasses, etc., shall be used by the timekeepers to observe the model in flight.

9. Each entrant shall be allowed three flights during the contest, the average duration of the three flights to be counted. Attempts of five seconds duration and under will not constitute a flight, but only three such attempts for each round shall be allowed. In the event of three failures, no time will be recorded for that round.

10. When called by the judges, each model must be ready for flight within three minutes or the competitor will be liable for disqualification from that round.

11. Minor adjustments or repairs, but no replacements other than rubber motors, may be made between competition flights. Repairs or trial flights may be made only with the consent of the judges, and after each repair the model must be reweighed and rechecked, and must possess the same characteristics as originally.

12. A competitor entering this competition thereby agrees that he is bound by the regulations herein contained, and by any special rules which may hereafter be issued in connection with this competition.

13. The judges' decision shall be final.

14. The winning nation shall be that which has in its team the individual competitor attaining the highest average duration of three flights.

15. The winning nation will hold the cup for one year.

The National Aeronautic Association takes this opportunity to encourage a more widespread interest in Wakefield events at regional contests. Not only does a successful Wakefield flyer qualify himself for an opportunity to represent his country in the International Event, but he derives a personal satisfaction in the knowledge that he

is competing in one of the most scientific and exacting phases of model aeronautics.

The Affiliation Plan

In its three months of operation, the new club affiliation plan for rubber modelers has been received with enthusiasm by the modelers of the country. Quite a number of model clubs, both in and outside the N.A.A., have sent in their fees with commendatory remarks about the plan. Chief among the new affiliated clubs at present is the Jordan Marsh-Junior Aviator League, numbering over five thousand in membership.

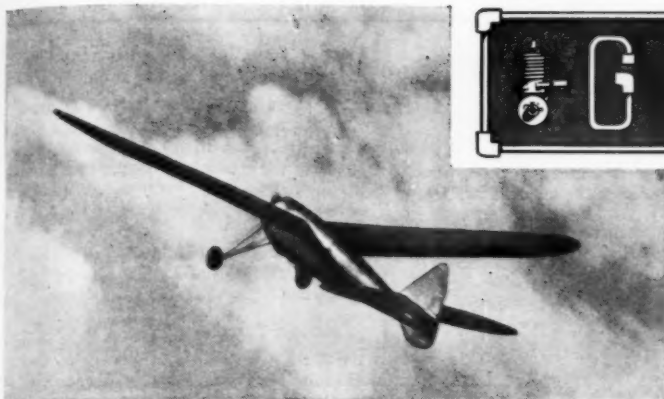
Following the usual trend in new organizations, a number of questions have come in concerning details in the new set-up. Following are a few more points which should be brought out in connection with the affiliation plan for rubber model builders:

First of all; gas model members, whether or not they are members of an affiliated club, are required to hold the individual gas model flyer's license, fee for which is \$1.00 per year. It is a good idea for gas model members, if there are not enough to form a separate chapter, to work with affiliated rubber model groups, to the end that those getting a start in model flying may receive the aid and encouragement of gas model members further along in the field. It is an established fact that the majority of good gas modelers are those who have had their baptism in rubber model work. The elements of model construction and flying are most easily and inexpensively learned in rubber model work, where not the least of advantages is the fact that neatness is learned in delicate work, making for far better-looking models when the enthusiast graduates to gas model flying. Occasionally, too, an embryo modeler who starts right out with a gas job and watches his work wash out on the first flight is so thoroughly disappointed that he gives up the hobby altogether. A little experience in flying slower, lighter models, where flying characteristics could be studied, would have at least given him enough confidence to hazard a reason for the ship's action and encouraged him to dope it out and try again.

But we're digressing . . . to continue, members of an affiliated club are not issued membership cards or lapel pins, except

(Continued on page 64)

JOIN THE NATIONAL AERONAUTIC ASSOCIATION!
SEND FOR APPLICATION BLANK TO N.A.A., DUPONT CIRCLE, WASHINGTON, D.C.



GAS LINES

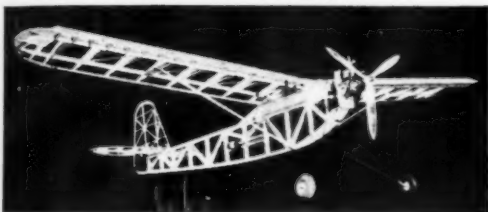
Official Section of the National Aeronautic Association Gas Model Division

Pict. No. 1. A Cavalier "in the clouds" above Amarillo, Texas. Built by Frank Davis

Here Are the New Gas Model Rules for 1939



Pict. No. 5. Bill Johnson and his plane



Pict. No. 2. A built-up stick model, by Kenneth Hay of Appleton, Wis.



Pict. No. 3. This Fokker D-7 by John Graham of Vista, Cal., should please World War fans



Pict. No. 4. Dick Sykes of Los Angeles, only 14, designed and built this successful low-wing



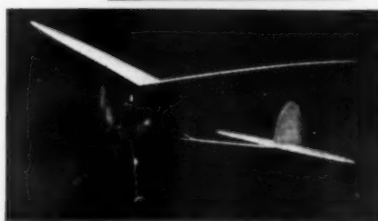
Pict. No. 8. Ed Hendricks' hydro gas model. It is a fine performer

WE HAVE good news this month for gas model fans . . . The National Academy of Model Aeronautics has decided upon the rules which will govern gas model flights during the coming year, 1939. These rules have been given careful consideration and have been okayed by the Power Model Committee of the N.A.A. They are as follows:

A. Models having from zero to 225 square inches. The models must use engines having up to and including .20 cubic inch displacement.

B. Models having 226 to

Picture No. 9. Richard Kispert's radio control plane. Robert Uphaus designed and built the successful radio equipment



Pict. No. 6. Tom Laurie of Fort Wayne constructed this 48 in. model in all balsa

450 square inches. These models must use engines having up to and including .30 cubic inch displacement.

C. Models having 451 square inches and over. These models must use engines having up to and including 1.25 cubic inch displacement.

Also, any contest may be held as an Open Contest for all sizes of ships under the old rules which have prevailed in the past, except that the duration of the motor run has been lowered to twenty seconds. Ships flying under this rule will be limited as follows:

The motor run shall not be greater than twenty seconds, the wing loading shall not be less than eight ounces per square foot, the cross section of the fuselage shall not be less than $L^2/100$ and the total weight of the model shall not be greater than seven pounds.

Some delegates at the Academy meeting wanted the new rules which include the three classes; others felt that these restricted builders to certain types of models of which they were not in favor—and they preferred the old rules to the new rules. Therefore model builders throughout the country may fly under either one of these rules. Under these conditions everyone should be satisfied.

From a number of letters received by your editor it is apparent that opinions in various parts of the country, concerning what rules should be, vary greatly. It is essential for the good of gas model aviation throughout the country that the majority of model builders be satisfied and not subject this majority of builders to the will of some small community, who may prefer to fly models of a restricted or unusual type. The ideal situation is one in which the rules for each builder's flying express the desires of the greatest number of model builders. Therefore in order to promote the

(Continued on page 50)



Pict. No. 7. Wallace Ewing of Arizona and his twin Douglas. It cost \$20

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**How To Build The Biplane
Sportster***(Continued from page 15)***Flying**

The first few preliminary glides should be given indoors; the cellar or a fairly long room making an excellent landing field. Make sure that the free-wheeling is "percolating" when the model is gliding. Adjust the wing positions slightly for a long, flat glide. And now, weather permitting, to the wide open spaces we will go. After a few hand glides, fifty turns should be given and the model launched in a slight right bank. Keep the model flying to the right both under power and in the glide by adjusting the rudder. A capacity winding of 180 by hand and 350 by winder should be slowly approached, with you gaining a wealth of experience in the meantime.

The Bomber Catcher*(Continued from page 19)*

And he is the U.S. Army Air Corps' Number One test pilot, the peer of high-speed air corps flyers!

Further, his flight was a routine cross-country long-distance job. He had no guns to operate, no enemy planes to face, no fear of mid-air crashes to hamper his one-man navigation, engine and control problems.

We recently queried the Army Air Corps' Wright Field test staff investigating pilot psychological and physiological reactions and his fitness for the operation of modern high-speed fighting ships. Their answer: "We have no material on the effect of high speeds on army pilots available for release at the present time!" Has the air corps foreseen the pilot's problems associated with high speed flying? Have they found that the airplane has progressed past the human's possibility of its control in actual combat with enemy ships? Lieutenant Kelsey's flight resulting in his shocked mental condition has been an actual experience which no test laboratory could suitably ascertain. The pursuit plane, as a military weapon, is not dead, we said last month. But is the pursuit pilot, capable of handling it, dead?

Screaming through the skies at 615 feet per second, every nerve on edge, wreaks havoc with a pilot's nerves. After several hours of this horrifying experience his senses begin to lull him into a false relaxation in security. And after seven and one-half hours of that murderous torture, Lieutenant Kelsey was a thing apart, a hulk without a controlling center. As he levelled out for his New York landing his port motor cut out. Lack of fuel or lack of proper mixture control? (The XP-38 was fueled to capacity at Wright Field just two hours previously!) In a daze he fumbled with the flaps, the propeller feathering gear and his throttle. All to no avail. His responses were dead. The ship caromed into a sand bunker out of control, a crazy set of conditions existing in its controls. The starboard propeller was full feathered yet the port engine had failed! Flaps and landing gear were up yet he was only a few hundred yards from the field. Lieutenant Benjamin S. Kelsey, pioneer hi-speed flyer, at fault? Not on your life. A human being's inability

to cope with the horror of controlling a modern aerial bulldog was at fault!

After the crash, under careful guard, the XP-38 was crated and returned to the Lockheed factory in Burbank, California. Damaged beyond repair and lying under a heavy tarpaulin in a small outhouse of the plant several interesting details were discovered. Firstly, it has a wing-span of 49 feet, 6 inches and a length of 32 feet, 4 inches. Its Allison engines, model SGV-1710-C600B, develop 1360 horsepower at 17,000 feet. The starboard engine rotates clockwise, its entire design having been altered for this specific airplane. A special Hamilton Standard constant-speed full-feathering counter-rotating propeller has been built for the starboard engine and a standard model for the port motor. Thus torque has been completely nullified and control made more simple. The rudders are, therefore, set in direct with the center line of the tail booms and require no torque off-set.

The wings are built up on a single shear spar principle, sheet Alclad 24ST aluminum alloy covered. The fuselage is built integral with the wing center section and is streamlined neatly into the trailing edge. Its forward portion is narrow and thin and houses the retractable nose wheel. This is steerable but may be locked and made full swiveling. All three landing wheels fold rearward and are completely covered with streamlined retracting metal plates.

The Prestone coolant is conducted from the cylinder heads to twin radiators located outboard of the tail booms. Oil coolers are situated on top of the motors. The exhaust gas, after having been utilized for the centrifugal exhaust-driven supercharger are carried within the booms to a point midway between the fuselage and the rudders where it is ejected into the air behind large metal covers.

The landing flaps are of a new Lockheed-Fowler design utilizing the surface-area increasing design without the use of projecting guide-posts rearward of the wing's trailing edge.

Two twenty-three millimeter cannon and two fifty caliber machine-guns are carried in the nose. Two thirty-seven caliber machine-guns are mounted in the outboard wing cells just outside the propeller arc.

Fuel is carried within the wing center-section in wing-wall tanks in which the wing itself is the gas tank. Capacity is 585 gallons with 42 gallons of oil. The pilot's enclosure swings upward and hinges on the starboard side in contrast to standard sliding hatches. The pilot enters by ducking under the tail boom and mounting a small ladder to the wing. Inside the pit the instrument panel and control mechanisms defy description. Suffice it to state that no instrument, gauge, knob, handle or control necessary for flight has been omitted.

In the light of President Roosevelt's demand for 3032 new airplanes, this nation's admirable re-awakening to the problem of its armed aerial defense and our pride in possessing the world's swiftest and most terrible fighting plane, it behooves us to predict an astounding future for the Lockheed XP-38. However, so many problems remain to be solved on this radical ship, years ahead of its time, that its place in our

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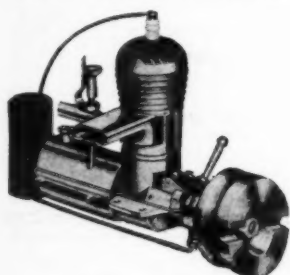
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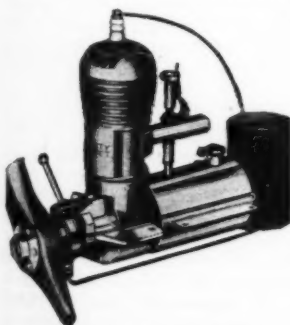
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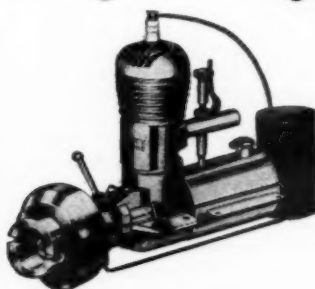
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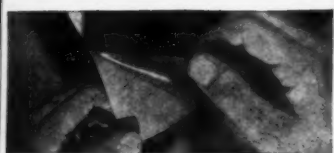
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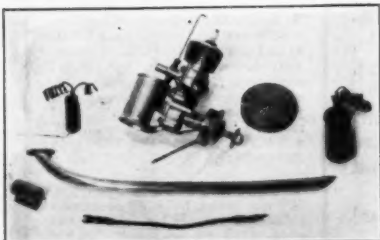
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pulleys are wrapped, possesses a radius of 2-1/2 inches. If the pilot exerts a force of 75 pounds on one of the control wheels, what is the magnitude of the force applied on the rear control surfaces?

Employing the principle of moments:
W (Force on the controls) x 2.5 = 75 x 10

$$W = \frac{750}{2.5} = 300 \text{ pounds.}$$

Then the mechanical advantage of the system becomes:

$$\frac{300}{75} = \frac{10}{2.5} = 4$$

The pulley represents a variation of the modification of the wheel and axle. The larger wheel possesses a grooved rim or sheave within which the flexible material, to which the effort and resistance are attached, fits snugly. Pulleys are widely employed in airplane controls wherever cable (flexible) control systems are installed. The drawing of Figure Two illustrates a typical control pulley installation. The pulleys in this case are designated as simple fixed pulleys. Equal forces applied at the extremities of the attached cables exactly balance each other. In other words, if friction and the rigidity of the cables are neglected, the tension in these members is constant or equal throughout their entire length. The mechanical advantage of the simple fixed pulley is thus seen to be unity. No advantage is gained through the employment of the pulley in this manner, its primary and final purpose being to negotiate sharp angular bends which control cables encountered in the normal airplane structure.

Various combinations of fixed and movable pulleys are employed in airplane factories and aircraft engine erecting shops for the purpose of lifting heavy members in and out of the structure. The most common of these combinations is the simple "block and tackle" and the differential pulley. A definite advantage accrues to the user of these devices, a man being capable of lifting enormous weights single-handed through their use. The mechanical advantage of the differential pulley, for instance, is determined by the radius of the larger sheave in the fixed pulley, and by the difference between the radii of the sheaves in the fixed pulley. It becomes apparent that the mechanical advantage with the difference between the radii of these two sheaves is small.

For example: An aircraft mechanic wishes to lift a "Wright Cyclone" airplane engine weighing 1,000 pounds, into the fuselage of a military plane by means of a differential pulley. The radius of the larger pulley is 5 inches, and that of the smaller pulley is 4 inches. What force must the mechanic exert in order to raise the engine into the airplane?

The mechanical advantage of the differential pulley is given as twice the larger radius, divided by the difference between

$$\text{the two sheave radii. Or, } \frac{2 \times 5}{4 - 5} = \frac{10}{1}$$

Then the force exerted by the mechanic

$$\text{is equal to: } \frac{1000}{10} = 100 \text{ pounds.}$$

The inclined plane, in its elementary

form, is perhaps the one form of simple machine that is not directly employed in the field of aeronautics, unless we consider some of the earlier experiments of the pioneers or even the tilted take-off platforms of some of the earlier transoceanic flyers. However, two modifications of the inclined plane principle that find a wide application in this field are the wedge and the screw. The former device, the wedge, is employed in the reverse sense in the case of the airplane wheel chocks. Instead of performing useful work, it serves as a deterrent in preventing the airplane from forward motion due to the thrust force exerted by the engine and propeller group during the warm-up period prior to flight. The effectiveness of wheel chocks increases as the angle of the inclined surface makes with the base line of the wedge is increased.

The screw in its elementary form is merely an inclined plane ascending around a central axis. In shape it assumes the form of a cylinder, the surface of which is cut in a uniform spiral which is termed "the thread." When either the screw or its mating nut makes a complete turn of rotation a longitudinal distance between two adjacent threads is displaced. The distance thus moved through is termed the "pitch of the screw." It is commonly expressed as the number of threads to the inch, or in some cases, to the centimeter. As in the case of the pulley, the gain in power attained through the use of the screw is derived only at the expense of a corresponding loss in distance. The mechanical advantage of the screw equals the ratio of the distance traversed by the effort in one revolution of the screw to the pitch of the screw.

Uses of the screw in aeronautics are manifold. Screws are frequently employed to secure wood and metal components of the airplane structure together. Precise measuring instruments which are constantly employed by aeronautical engineers and mechanics in the course of their work rely on the principle of the screw. Their construction incorporates some form of accurate screw with a head divided into a number of equal parts so that they will register any portion of a revolution. The pitch of the screw being known, it becomes a simple matter to determine the distance moved parallel to the axis of the instrument when the head is rotated through one of its divisions.

Many forms of trimmer and stabilizer adjustments incorporate sleeve fittings which slide along a running threaded shaft. Perhaps the most prominent application of the screw to the airplane is represented by the propeller. To clarify the connection, we may recall at this point that the airplane propeller is called an "airscrew" in certain foreign countries. The rapid rotation of the airplane propeller tends to push a mass of air backward against the fuselage. The attendant strong blast of air thus swept backward is termed the "slipstream," and is caused by the fact that it tends to slip off from behind the blade element because the medium in which the airplane operates—atmospheric air—is so thin that it will do this. Motion of the airplane is affected since the inertia of the air which is a fluid medium produces a reaction against the propeller blades and forces the craft ahead.

The reader who has followed this series

of discussions will more than ever realize that the science of aerodynamics is purely an application of the basic principles of physics. As we go on, other pertinent examples of this will be given from time to time, hoping that each discussion will further enlighten the beginner in the elementary problems of aeronautical engineering.

A Pursuit Plane In Miniature

(Continued from page 23)

over from the front view.

When the wing is drawn, refer to Fig. No. 1 and start to draw the side view of the engine cowl. When finished, draw the front wheels and under-carriage. Now refer to Fig. No. 10 and lay out the fuselage contour. Refer to Fig. No. 7 and draw the vertical stabilizer. Refer to Figs. No. 1 and No. 8 and draw the horizontal stabilizer. Then start drawing the windshield. Draw all fine details with the exception of the wing details which are to be added when the top view is finished.

Refer to Fig. No. 2 and fill in all details around the under side of the engine cowl and add the landing gear chassis by projecting lines from the left side view and by referring to Fig. No. 2. When the lower works are drawn, start to draw the windshield and vertical stabilizer.

On the top view, start the propeller's center line and start the top view drawing in the same order as you draw the left side view; i.e., draw the wing first, then engine cowl, propeller. Refer to Fig. No. 10A and draw the fuselage top view. Refer to Fig. No. 8 and draw the entire horizontal stabilizer. Refer to your side view and draw the top view of the vertical stabilizer; also the top view of the windshield by referring to Fig. No. 3 and your side view drawing. Add all the fine details to the top view and proceed to do so on the other view.

Building the Model

The large airplane is of all metal construction. However if you do not wish to make the model of metal you may make it of wood. A beautiful job may be made of it by either method you may choose to use. Every modeler has his own "pet method" of building the fuselage . . . and the plans were drawn to accommodate the different methods of building this difficult section. Some may make the fillet (line "UVK" on Fig. No. 10 and 10A) as a part of the fuselage; and some make these as two separate units. Whatever methods he chooses, there are provisions in the plans to help him in his work in laying out the rough fuselage. He may make the fuselage in one piece or he may choose the common split-method (screwing two boards together, shaping the fuselage, unscrew and take the boards apart, then hollow it out. When finished, sand the insides, then glue the two sections together.) Whatever methods you choose to make your fuselage, make your templates accordingly. If you are just going to make the fuselage shell and add the fillets on later (beeswax or plastic wood or any forming com-

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More value for your money! Precision-made in the world's largest and most completely equipped plant devoted to the manufacture of gas model motors. The 1939 Model D includes the sound engineering advances used in other Brown Junior Motors. New and improved timer! New Chrome Molybdenum Crankshaft! New Micrometer Needle Valve! New transparent gas tank! Motor shipped ready-to-run. **\$12.50** complete with coil and condenser. **\$12.50 P.P.**



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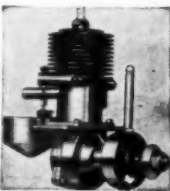
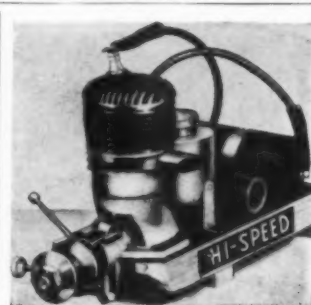
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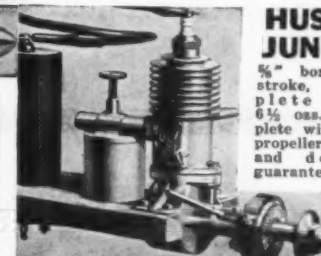


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3/8" bore, 1/2" stroke, 1/2 H.P. complete weight 6 1/2 ozs. Complete with coil, propeller, oil and double guarantee, postpaid.

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SAME SPECIFICATIONS AS MODEL D, SELLING FOR \$12.50

YOUR LAST CHANCE TO GET ONE OF THESE MOTORS. WE HAVE ON HAND AN AMPLE SUPPLY, BUT DO NOT EXPECT THEM TO LAST VERY LONG.

1939 BUNCH MOTORS

Specifications: All Bunch Engines full 1/2 H.P. 3300 r.p.m.: 1 1/2 H.P. 3300 r.p.m. Bore 3/8", Stroke 1 1/8". Bare Weight 8 1/2 ozs. Complete, ready to run, with coil, condenser, fuel tank, spark plug, instruction Manual. **\$9.95**

MIGHTY-MIDGET Upright Assembled	9.95
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SCIENTIFIC "COMMODORE"



Wingspan 6 feet
Overall length 56"
Wing Area 5.2 sq. ft.
Total weight with motor and
ignition mounts 3 1/2 lbs.
Airfoil section. Gottingen 549
Glide Ratio 16 to 1
Rate of Climb Approx. 700
ft. per min.

Complete
Less
Wheels **\$6.95**
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COMMODORE DeLuxe Gas Model

A GREAT ADVANCEMENT IN GAS MODEL DESIGN

The new Scientific Commodore gas model has been designed by the well known "Eaglet" gas model designer, Mr. Ben Sheresaw. In this new model Mr. Sheresaw has combined all his knowledge and efforts to build what we believe the finest gas model in America.

Any inexpensive 1/4 horsepower engine may be used. On many test flights the "Commodore" was powered very successfully with the Brown Jr. Model D engine. Other engines such as the Brown "B", Ohlsson, Midget Gwin, Dennymite, Syncro, or any other reliable make motor may be used with success.

KIT IS 100% COMPLETE, including highest quality sheet and strip balsa, finest spring steel wire, all metal fittings, ignition wire, large full size plans with explicit instructions, all necessary liquids, etc., etc.



THE STREAMLINER

Wingspan 6 Ft. Wt. 2 1/4 lbs. Length 43"

COMPLETE KIT with Ready-made balsa ribs, Stamped Metal nose cowlings, liquids, all balsa cut to correct sizes, nuts, bolts, electrical connections, celluloid, rubber, bamboo paper, large full size detailed plans giving every bit of information needed for building and flying the "Streamliner."

Complete kit, less wheels, at your dealer or direct, only **\$4.95**
Complete kit, including a pair of 3 1/4" pneumatic rubber air wheels, only **\$5.95**

MISS AMERICA GAS MODEL

NOW HOLDS
WORLD'S RECORD
WITH FLIGHT OF
46 MINUTES ON
27 SECOND MOTOR
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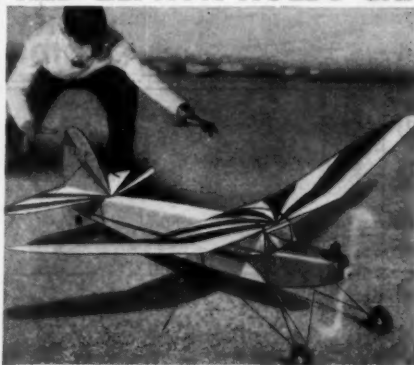
Word has just been received from N.A.A. headquarters at Washington confirming this flight made by Mr. Phoenix of Houston, Texas.

KIT IS 100% complete with 3 1/4" Pneumatic wheels, 7 ft. wing; wt. (less motor) 2 1/2 lbs. 22 min. on one 2 1/2 oz. fuel; 18 to 1 Glide.

\$7.50
P.P. oz. fuel: 18 to 1 Glide.



RED ZEPHYR HOLDS CHAMPIONSHIP OF FRANCE



THE BIGGEST KIT VALUE EVER OFFERED



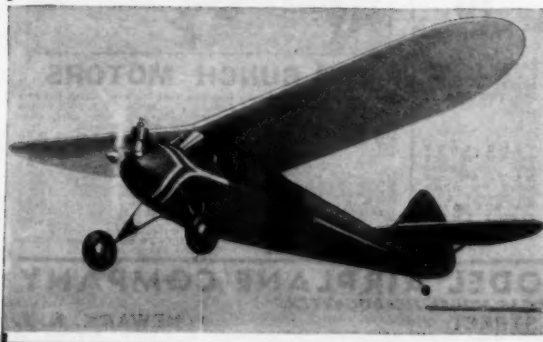
16 year old Raymond Levy of Paris, France, flew his Red Zephyr to a national record of 1 hour and 20 minutes, covering a distance of 25 miles.

6 FT. WINGSPAN

With 3 1/2" Pneumatic Rubber Wheels. \$5.95 postpaid.

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(Less
Wheels
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44" Wing—Length 32"

Flying Weights 17 ozs.

Truly the Finest Midget gas Job Offered to the Gas Model Builder Today.

DESIGNED FOR USE WITH MIDGET GAS ENGINES

The trend in the size of gas models today is toward a ship of about three to four feet wingspan, and corresponding light weight. The "Eaglet" won 2nd and 3rd places at recent Philadelphia gas meet. Or At Your Dealer's.



33 Perry St., Belleville, N.J.

Gentlemen:
I am sending you a picture of my Eaglet gas model. This view shows it coming in for a landing with motor shut off. After the motor cut she glided for over 30 minutes.

The model sure was easy to build from the complete kit. Scientific is headquarters for all my models.

Very truly yours,
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Everyone true pitch finely made, perfect balance.

ANY SIZE
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DELUXE TRU-PITCH PROPELLERS

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WHAT SIZE PROPELLER DOES YOUR MOTOR REQUIRE?

Ohlsson Gold Seal 14", All Brown Motors 14", Syncro Ace 4 Special 14", All Bunch 14", All Denny Mite 14", Cyclone 13", Forster 16", Phantom 12", Bantam 10", Hi Speed 12", Ohlsson 12", 12" Trojan 11", Husky 11", Elf 10", Bee 9", M&M 12",

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Absolutely punctureproof—leakproof. Per Pair \$1.50 P.P.



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Small size for Brit. Trojan, Mighty Midget, Gwin, 75c

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Shock absorber, gives knee action effect.

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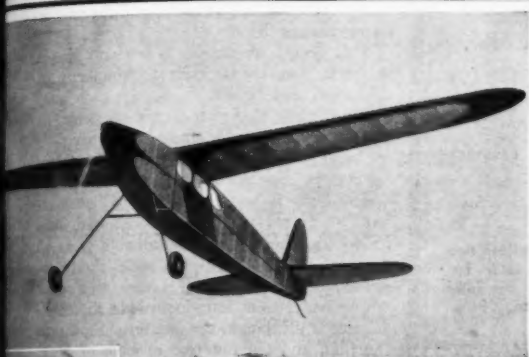
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Wingspan 24
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Flies 1/2 mile



"ORIOLE" CONTEST ENDURANCE MODEL

Flies 2 to 3 Miles: Overall Length 34"

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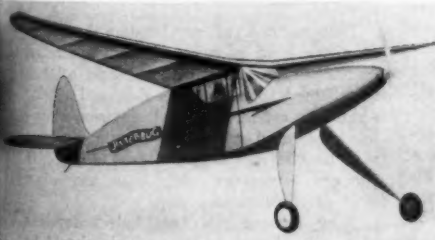
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25" Wingspan—Length 20 1/2"—Light Weight

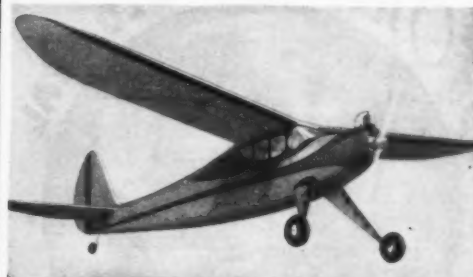
FLIES OVER 1 MILE (6,000 feet)

Other famous Flying Model originated and designed by Scientific. This trim endurance model flies one mile or more. It creeps along the ground for a few feet, climbs into the air, and up... then gradually glides to a perfect 3-point landing! It is one of the most graceful places you will ever build! Look at that shapely wing—detachable, too!—that gives "Jitterbug" its graceful, thoroughbred appearance. The construction is so simple that with little or no past experience can easily build the "Jitterbug" in 50¢.

Kit includes all materials including streamline wheels and landing gear. Full size plans and explicit instructions. **ONLY 50¢** Postpaid at your dealer

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Get the Thrills of Gas Model Flight THEY LOOK, FLY AND SOUND LIKE GAS MODELS



"FIREFLY"

Wing 36", Length 28"
Wt. 4 ozs.

FLIES 1 MILE (\$280 Feet)

The "Firefly" is the next best thing to a genuine gas model. Its advance clean design and beauty will startle you. Think of it—your own gas type model that will soar majestically aloft, steady and graceful as an airliner under expert command! Dummy motor, propeller, full size plans, and a pair of M & M pneumatic rubber wheels. **\$1.95** Postpaid

A LADY BUILDS A FIREFLY GAS TYPE MODEL, AND IT FLIES FOR MORE THAN SIX MINUTES



Mrs. Kline and Firefly



Ready for take-off



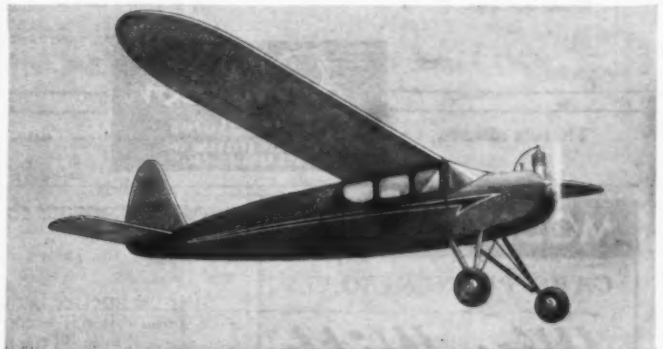
Flying high



Coming in for landing

Dear Sirs:
Enclosed find pictures of Mrs. Kline and her Firefly model. This is her first model and has proven very satisfactory. To date the model has had about 70 good flights, many times flying over six (6) minutes. We flew it in windy weather and it was really amazing to watch the Firefly climb high out of the flying field.

Yours truly, Dan Kline.



MISS AMERICA Gas Type—Rubber Powered Model Airplane

40" Wingspan
Weight 4 1/2 ozs.

Length 27 1/2"
Flies 1 MILE (\$280 feet)

This is an exact replica of the full size Miss America gas model. Recently a Miss America gas model flew for 46 minutes on a motor run of only 27 seconds, breaking all world's records for so short a motor run.

This new small Gas Type Model has all the features of the large model. It is a real contest flyer and capable of outdoing anything in its class. It takes off from the ground within 4 feet and heads straight up, climbing at an unbelievably high rate without the slightest bit of stalling. Can easily be built by a modeler with little or no past experience. On test flights it passed every qualification of the rigid Scientific standards. Contents of Kit 100% complete (similar to parts in Firefly and Flea).

\$1.95 including a pair of M & M pneumatic rubber wheels. **PRICE** POST-PAID

THE FLEA FLIES 1 MILE (\$280 ft.)

Wing 36"
Length 28"
Weight 4 oz.

This new type of model airplane developed by Scientific will give you all the thrills and excitement of building a real gas job. Thousands of builders have constructed these remarkable models and gotten truly exceptional flights. Build one yourself now and experience the fun you, too, can have with a fine flyer!

The Flea kit is absolutely complete, containing all balsa parts cut to size, dummy gas engine and spark plug, ball bearing washer, motor hum ratchet device, insignia, rubber, metal parts, liquids, full size plans with explicit instruction. Complete, including a pair of M & M wheels..... **\$1.95** Postpaid



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only UP-TO-DATE miniature motor!

Ohlsson has no interest in making extravagant claims. Those words above "only UP-TO-DATE miniature motor" mean just what they say! And you fellows who are going to fly the ships can prove it right here. Check these exclusive Ohlsson features and you'll know that the Ohlsson Gold Seal is truly tomorrow's motor today!

- Only motor with genuine ball bearing thrust bearings.

- New high turbulence type piston.
- Low Head non-inflammable gas tank of Clear Composition.
- Fully enclosed Timer, absolutely fool-proof.

Your Ohlsson Gold Seal will outlast two ordinary motors. Ask your dealer for demonstration and write today for fully illustrated descriptive brochure. Price only \$18.50.



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one Leader!

MODEL OWNERS

CARS - PLANES - BOATS

Win With



**MORE SPEED-POWER
BETTER LUBRICATION**

Experience has proved that the basic lubricants in **DDXR-2 Speed Fuel** are helpful not harmful to model engines. More Speed—Less Friction—Longer Life—Cleaner and Cooler Running.

More News in model engine tests. Blended and developed by Racing Experts and World's Record Holders after many tests especially for your model engines. Will run in any 2 cycle model engine.

NOT AN OUTBOARD RACING FUEL

It takes a few minutes to MIX—We send you the Formula and 1/2 pint Can of **DDXR-2**.

You can purchase the ingredients specified in Formula at local drug store; add Can of Power Blend, make approximately 1 quart of this Sensational Speed Fuel. No extra oil needed.

Write for CAN & FORMULA TODAY

\$1 & 10c coin or stamps
DDXR SALES COMPANY
235 Madison Ave., N. Y. City
N. Y. Users available at Polk's Model Craft Hobbies

pound) just make the templates to check only the fuselage curve and leave out the fillet curve, (as shown in sections "A-2" and "A-3.")

After the fuselage is shaped on the outside, hollow it out according to the way you planned to build the model (the dotted lines on sections "A-3" to "A-7" may be hollowed out, remain solid or be a separate piece without spoiling the true curve of the ship.) When the fuselage is hollowed to the size you want it to be, begin to make the center wing section as shown on the plans. If you wish to cut away the portion to allow the fitting of the wing to the underneath of the fuselage shell, you may do this; or you may carve a depression on the top side of the center section to fit the lower side of the fuselage. Whatever method you choose, make allowance to make the fillets realistic. When the center panels are about ready to attach, make the right and left wing panels.

Then make the tail surfaces and attach all units the way you plan the model. Before you attach permanently check up on your controls if you are going to install them as shown on Plate 3. If you wish to add inside details in correct proportion to your scale, refer to the Suggested General Arrangement page which is Plate No. 3. Before attaching any external parts sand the entire model smooth with medium size sandpaper. After all the coarseness has been removed resand with fine sandpaper; then shellac all external surfaces. When dry, resand with extra

fine sandpaper down to a finish that feels like glass. The first V-143 was painted the standard U.S. Army color scheme; which is Army-blue fuselage, Army-yellow orange wing and tail surfaces with red, white and blue cocades and stripes.

Building the "Bee"

(Continued from page 11)

also is mounted on the nose. The batteries are located inside the main part of the fuselage. However, no wires need be disconnected, for when the nose is slipped in place, contact is made with the battery by means of two plugs which help to hold the nose in its normal position.

This design, therefore, is not only simple in itself, but lends itself to simplicity of operation and repair.

We suggest that you do not overlook this little plane when you sharpen up your tools to build a contest or sport model to fly during the fine weather this summer.

The body is made out of 1/16" medium-hard sheet balsa. Since the required four-inch-wide sheet is not obtainable from all dealers, fit two two-inch-wide sheets together and join them with cement. For the whole body, four four-inch-wide sheets are required. Enlarge the pattern shown on the plan and cut out two of each of X, Y, Z and W. Make sure that the grain runs in the same direction on each pair of patterns. Because the small pattern W will be bent in a half circle in due time, the grain has to run up and down instead of lengthwise as on the others.

The lower half of the fuselage is made first. Take the two patterns Z and paint one side (the inside surface of each) with dope. Upon drying the dope will warp the side into a slight curve. Repeat this process and this curve will increase to the point where the quarter formers, D, B and C can be placed and cemented in their places with very little forcing. In case the wood is harder or the dope is too thin more than two coats of dope will be required; however, before the dope brush is put into action make sure that one left and one right half is made.

This method of pre-bending has more than one kind of practical value. First, it increases the strength of the sheet balsa at least 50% with very little additional weight; second, it renders the body interior water-, lubricant- and gas-proof; and finally, once it is bent it will keep its shape with fewer formers, stringers, etc., than any other type of construction.

Now cement the two halves together along the bottom seams. This should be done by easy stages starting at the nose. While doing this, keep the halves apart, approximately 3 1/2 inches at the nose, with auxiliary pieces of balsa. Use plenty of pins and do not try to do more than two inches at one time. Since the strain is variable over the whole length of the seam, if any given two inches would require more than five pins to secure for cementing, it is wiser to take only one inch and cement before proceeding. Do not use an excessive amount of cement or smear it on the outside of the body.

Now make up the center frame. First, enlarge the drawing of the same to the

proper size and cut out the two longerons. With the cross braces cemented in place it represents the backbone of the body. Spread cement on the outer edge of the longeron and force this assembly into the body, flush with the top line. At some places the body sides will not even touch the longerons but that should not be a problem. Use pins at these or any other points where the fit is not perfect. From the center frame onto the very end of the body a piece of 1/16" sheet balsa is fitted in and cemented.

Now two of patterns Y are cut out and pre-bent as described before. Formers B and C are cemented in place and the top seam joined. This assembly is placed on top of the already finished lower part and first pinned on, using plenty of pins. In this case the strain is much less than in the previous cases so the full length of both sides can be done without undue forcing. The cement is put into the crack with a small glue stick or wire and after about five minutes the pins are removed and the job is inspected. Any imperfection is easily fixed by cutting the cement at the particular spot with a razor blade, repinning and recementing.

Before we proceed with pattern X the battery box has to be made up and fastened in the body. A cardboard tube, generally used in laundries to roll the curtains on, is cut to the required line and one end is plugged up with sheet balsa, with a piano wire spring attached. In the front two wire eyes are cemented and the whole box is secured up to the two front braces. The rear connection should be soldered to the spring.

Now former A is cut out, pinned and cemented at the exact angle as shown on the plan. Next the cabin roof is made, which is of two pieces, and glued at a slight angle to take the wing dihedral. With the aid of the wing shield strut, the roof can be fastened in place.

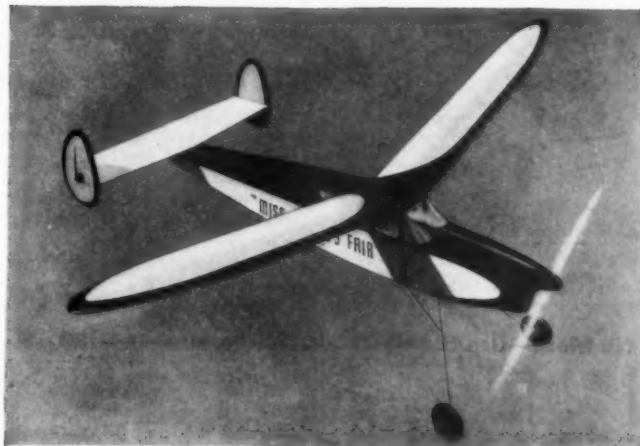
To pre-bend pattern X, one coat of dope should be sufficient because very little curve is required. First it is glued in place, then the windows are cut out with the aid of a small cardboard pattern. Follow up with joining pattern W in and bend it around former A. Now the celluloid windows can be set in and the whole body sandpapered smooth. Give the body two coats of varnish for protection against gas and oil.

The nose of the model is a separate piece containing everything but the batteries. Two suitable balsa blocks are glued lightly together and the outside shape is carved to fit the body perfectly. Now the blocks are separated and hollowed out to 3/16 of an inch thickness. After rejoining them, formers D and A are glued in place. A felt ring cut out of an old hat cemented to these formers serves as a fine shock absorber.

To install the motor study your particular power plant first. See if you can reproduce a similar arrangement as shown on the plan and pictures because it proves to be both practical and neat. We have used the new "Hi-Speed" engine, but any other small engine will do.

Pay special attention to the position of the motor bearers. They are in line with the center line of the body from which most of the important measurements start. Each basswood bearer rests on a ledge carved into the motor housing and secured by screws.

"MISS WORLD'S FAIR"



FLIES 3 MILES

**50" WING SPAN
LENGTH 35 1/2"
WEIGHT 3 OZS.**

**\$1.50 POSTPAID
OR AT YOUR
DEALER**



Here's as keen a model as you'll ever see. Notice the snappy lines, the well-designed fuselage with slanted windshield and enclosed cabin, its rakish sweep back wing, the distinguishing shape of its inverted type nose with open radiator, and the graceful twin rudders that are characteristic of present-day speed transports.

And Boy! how she can fly! The model runs along the ground for about 5 feet—then as gracefully as a gull, its wing lifts the model gently into the air. It climbs rapidly and gains an altitude of several hundred feet in little time all the while spiraling in large circles the diameter of a city block.

After the rubber motor is entirely unwound the model goes into a beautiful glide which can only be described as sensational. On one flight the model glided for over 2 miles, after which time it came in for a perfect 3 point landing.

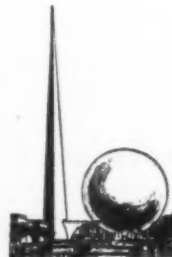
If you're a beginner, you'll surprise yourself with the striking and unusual model you can build so easily from this complete kit. And if you're an expert, you'll find the "Miss World's Fair," a model that's worthy of your best efforts.

Here's the model that will make them sit up and take notice when you enter it in the next flying contest. **ORDER YOUR KIT NOW.**

KIT IS 100% COMPLETE with 15" machine cut balsa, center drilled propeller; ball bearing washer; all flat parts—ribs, bulkheads, etc., clearly printed on sheet balsa; tissue; formed wire parts; streamline wood wheels; liberal quantities of cement and paper adhesive; celluloid for windows; approximately 30 feet of finest quality brown contest rubber; washers; nose plug; celluloid, etc., etc.

In addition every kit contains a set of the clear, full size plans and detailed directions that have made so many friends for Scientific models among beginners and experts alike. A sensational buy at \$1.50, postpaid. **SEE IT AT YOUR DEALER.**

Developed by Herbert Greenberg, Designer of the Oriole.



SCIENTIFIC MODEL AIRPLANE CO.

218-220-MA5 MARKET ST.,

NEWARK, N. J.

POLK'S PIONEER



MONOCOQUE
All Balsa Fuselage
NO PLANKING STRIPS TISSUE

Brand new exclusive method makes it possible for even a beginner to build the super streamlined monocoque elliptical all balsa fuselage. Balsa stressed wing. Simple as A. B. C. Every advanced feature incorporated in the kit. Wingspan 39", length 30", Meets N.A.A. rules.

\$1.50
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WIN WITH

SPECIAL BROWN CONTEST RUBBER

Used by all record breakers. The only rubber that holds every world's record. Special BROWN CONTEST RUBBER makes every model a potential winner!

Costs No More—Use the Best!

Size									
1/32-28"	Sc	225	30c	1/8-7 1/2"	Sc	225	75c		
3/64-18"	Sc	225	35c	9/64-6 1/2"	Sc	225	80c		
1/16-14"	Sc	225	40c	3/32-12"	Sc	225	90c		
3/64-12"	Sc	225	50c	1/4-10"	Sc	225	\$1.00		
3/32-10"	Sc	225	60c	3/16-10"	Sc	225	\$1.10		
7/64-8 1/2"	Sc	225	70c	1/4-7"	Sc	225	\$1.25		

All 1/30" Thick—Minimum Order 50c

DEALERS:—There's a great market for genuine SPECIAL BROWN CONTEST RUBBER. You can buy it in skeins or on spools. Write on letterhead.



Designed to fly as
MONOPLANE
or
BIPLANE

SPAN 40"
Wt. 18 oz.

**YOU CAN
CONVERT
IN A JIFFY!**

2 in 1

DeLuxe Midget Gas Model Kit

for small bore engines

THE HUMMING BIRD

Instantly Interchangeable—Biplane or Monoplane

Simple to build; an outstanding performer for competition or sport. NOTE: The Humming Bird is the ONLY MODEL DESIGNED TO FLY AS A BIPLANE OR MONOPLANE! ★ Removable power unit ★ Ready cut notched ribs ★ M & M Pneumatic Wheels ★ Semi-carved Propeller ★ Full size plans ★ Colored bamboo paper ★ Berryfold Liquids ★ Plans only 50c. 100% complete Kit postpaid **\$3.95**

EXHAUST MANIFOLD

Use it to prevent "greasy sides." Streamlined, gleaming brass.

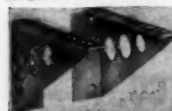


ONLY \$1.00

Fits all models of Brown Jr. and Mighty Midget engines.

TAIL WHEEL AND FORK

Made of aluminum with sponge-rubber wheel. Wt. less than 1/2 oz. Fits 50c



Aluminum MOTOR MOUNT

For all Midget Engines under 1 1/2 H.P. Weighs 1 1/2 oz. Handy and practical. Only **35c p.p.**

POLK'S 429 Seventh Ave., Dept. M-5
NEW YORK

The connection between the motor housing and the batteries is maintained by large bushings used for jacks in the body and 1/16 of an inch piano wire for plugs fastened in the nose.

The tripod landing gear is bent out of 1/16" piano wire and soldered together. The nose is held to the body by rubber bands and piano wire hooks the same way as the wing.

Wing and Tail

The wing ribs are cut out of 1/16" medium balsa. We have used the Grant airfoil which is both practical and an excellent result "getter." The curving trailing edge has to be enlarged first to normal size and then cut out of 3/16" sheet balsa. Assemble the wing on a flat board and add the balsa leading edge and cap strips after the frame is dry. No center section is used. The center ribs of each panel are tilted slightly, resulting in the correct dihedral angle when joined. The underside of the wing is covered with double tissue to prevent frequent punctures. On the original model a dihedral of 4 1/2 inches was used. However, this may be a little excessive. We suggest, therefore, that you use a dihedral of about 3/4 inch per foot or span, or a rise on each wing tip above the highest point of the center section of 3 3/8 inches.

The elevator is also made into two halves. While the airfoil is a simple streamline, the construction is the very same as the wing.

The rudder is made out of 3/16" stock except for the rudder tab, which is 3/32". When sandpapered, tapered and then tissue covered, adjustments can be made easily without cracking it.

The solid balsa block holding the tail assembly is first carved to shape, then cemented lightly to the body. Then a square piece is hollowed out and a wooden plug made to fit the same. Now the wooden plug is glued to the body while the balsa block is lined up above it. The tail surfaces are glued on with infinite care and inspected later for a perfect rigging.

Flying

For the first trials wait for a calm hour no matter how long it takes. Make sure that the wing is firmly strapped on the body and hand glide the model with a little more push than a rubber powered ship usually requires. In case of a steep glide or a stall, adjust the wing incidence to correct these misbehaviors. Your ship should glide straight, slow and recover easily from bad angles of attack. When the glide is adjusted to your satisfaction, try a powered flight with the rudder set slightly to the

right to counteract torque. Observe which way the model turns both under power and during the glide; gauging the next adjustment accordingly, and so, little by little "making friends" with your model and training it to your own liking. Our model weighs twenty-one ounces complete and has 380 square inches of wing area, meeting the NAA weight rule exactly.

Frontiers of Aviation

(Continued from page 21)

Bell pursuit, as you know, has its Allison engine at the C.G. with the propeller shaft running between the pilot's legs. The Curtiss ship is said to be the new Hawk 75-R powered by a Pratt & Whitney engine which claims to be the fastest climbing airplane in the world. Planes were bid from one ship to lots of 2,000. Taking as an example prices in lots of 40, Seversky bid \$46,716; Curtiss, \$39,580 and Bell \$42,075 per plane.

When it crashed at the end of a record-breaking flight across the continent, details of the Lockheed Model "22" interceptor reached the papers sooner than expected. Its total flying time was only seven hours, two minutes, breaking Howard Hughes' trans-continental flight record! The papers said the plane did 400 m.p.h. in tests at March Field and for once they were very close to being right. Powered by two 1200 hp. Allison engines, mounted just forward of the leading edge of the wing with line of thrust slightly below the chord line, the airplane should do 400 m.p.h. It is equipped for high altitude flying. The single pilot that is the entire crew sits in a small enclosure which is nothing more than a bulge in the wing between the two engines. However the nose of the pilot's enclosure projects forward a considerable distance in front of the large propeller spinners and holds five machine guns, a five pound cannon and a goodly supply of ammunition. The tail is on what is said to be steel booms neatly faired from the engine nacelles. Rumor has it that Vultee is working on a plane of this type.

The landing gear is tricycle, and it was this that tangled in a tree when the plane was landing that caused the crash. One engine failed when the plane undershot the field, and the other thus almost turned the plane into a spin. It was almost the same incident that caused the crash of another of the army's superships when Douglas' swift little attack-bomber met its doom.

The Douglas, built at the former Northrop plant, was making a dash across the field when the pilot cut one engine to make a single engine climb. However, the other engine appeared to pull the plane into a spin. Some say the vertical tail collapsed; nevertheless the ship went into some weird gyrations and crashed. On previous one-engine tests the airplane flew remarkably well and climbed just like a pursuit. It is said that Douglas is now out of the attack-bomber competition, but no doubt more of this type will be built for export for it is one of the best military airplanes we have ever seen. We were practically under it when it went out of control, and it was certainly a sad sight. France is the most likely purchaser.

As we go to press the competition in which the Douglas was to enter is full under way and of course rumors are running thick and fast. Some say only Curtiss, Stearman

HOTTER, JUICIER SPARK—
COIL

Quicker Starting!
Improved Performance!

Lab. Tests prove this coil without equal! Quicker starting! Hot spark! A consistent, completely dependable performer. We guarantee on a money-back basis—Your complete satisfaction! Order now—you risk nothing! 1 1/2 volt \$3.00—3 volt \$2.75.

Dealers and Jobbers write for representation.

POLK'S, 429 7th Ave., New York, N. Y.

Berkeley's New Rubber Powered—30" Wingspan "BUCCANEER"

WITH BALL BEARING PROP SHAFT
BALSA COVERED WING—"SEMI-PLANKED" FUSELAGE
WIRE "GAS MODEL TYPE" LANDING GEAR

No airplane in the history of model building has established such a long line of records equal to that of the "BUCCANEER" Gas Models, holder of both the Senior and Open World's Record under both limited fuel allowance and limited engine run rules. In response to your demands we give you the rubber-powered "BUCCANEER." Designed for a 1-cylinder Menasco engine to give scale model appearance.

It includes everything to build the model as pictured. All balsa parts are printed out; semi-finished nose block. Liberal quantities of cement and dope; and full-size, easy-to-follow plans.

\$1.00
P.P.



\$5.00 Prepaid
in U.S.A.

Complete Kit
Less Wheels & Power Plant

The "BUCCANEER-STANDARD" 51 1/2-FOOT WINGSPAN—FOR 1/6 TO 1/5 HP.

Limited Engine Run Champion and Certified Senior N.A.A. Record Holder. Twice as strong as other models of the same size and weight. Beautiful lines, perfect flyability and snappy performance make it America's Number One Gas Model.



9 ft. Wingspan
Simplified MONOCOQUE
CONSTRUCTION for
1/6 to 1/3 h. p.

\$1.50 P.P. in
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The "Custom-Cavalier"

Nearly every model builder dreams of the day when he can own and fly a "Custom-Cavalier." There is no model like it. Easily adapted for radio control.

EVERY BERKELEY GAS MODEL KIT INCLUDES:

1. Full Size Plans with pictures and three-dimension sketches of the construction. 2. All wooden parts printed out. 3. All Balsa Strips and Blocks cut to size and properly graded for strength. 4. Special Steel Wire for Landing Gear. 5. Hardware, Metal Fittings and Ignition accessories. 6. Cement and Colored Dope (Choice of Color). 7. Wings are removable on all models. 8. Everything is included to complete the model exactly as pictured except the power plant and wheels.

NEW 1939 BROWN JR. MOTORS

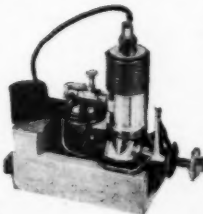
Model "D"

\$12.50 P.P.

Complete
Ready-to-Run

New Improved Timer!
New Chrome Moly.
Crankshaft!

New
Micrometer
Needle Valve!
New
Transparent
Gas Tank!



Model "B"

\$21.50 P.P.

Precision Built. Special steel cylinder and piston individually fitted. Cadmium plated and mounted on skids.

MODEL "C" Identical to "B" Model except for Aluminum piston and special rings. **\$18.50** P.P.

BERKELEY "Stop-Watch" FLIGHT DURAL TIMER

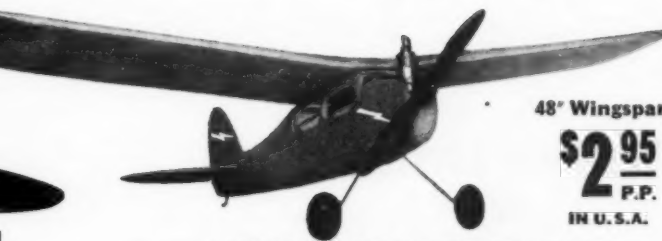


Now you can install a "Stop-Watch" Timer in your lightest gas model at no increase in price. New dural timer weighs only 1 1/4 oz. Adjustable with split-second accuracy up to 55 seconds.

NOW \$2.00 P.P.

MODEL CRAFT

Gas Model Propellers Completely finished.
All Sizes 10" to 14" 25c each P. P.



48" Wingspan

\$2.95
P.P.

IN U.S.A.

The "BUCCANEER-48"

1st PLACE WINNER AT NEW YORK, PHILADELPHIA,
MINNEAPOLIS and PALM BEACH

Everywhere throughout the country this ship is setting the pace in small bore competition. Semi-monocoque construction makes it the strongest model for its size ever designed. Weighs approximately 21 ounces with Ohlsson "23" Power Plant.



The "CAVALIER-STANDARD" 6 FOOT WINGSPAN for 1/7 to 1/4 h. p.

This plane will outclimb anything with equal power. You have to see it perform to appreciate it.

\$5.95
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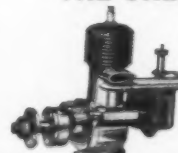
THE OHLSSON "23"

1/7 Horsepower

5/8" Bore x 3/4" Stroke

The engine that powered the "Buccaneer-48" to the Small-Bore Championship. Easy starting and gives nearly two lbs. static thrust.

\$16.50 P.P.



Ohlsson Gold Seal—1/4 H.P. \$18.50 P.P.

New!!



AERO-SPARK COIL

In publicly conducted tests of all spark coils, this coil was proven to have superior spark heat and gap characteristics with minimum amperage draw on the battery. Sold complete with snap-on high tension leads and mounting brackets.

3 VOLT COIL. Weighs 2 1/2 oz. **\$2.75** P.P. Will operate on two small cells.
1 1/2 VOLT COIL. Weighs 2 1/4 oz. **\$3.00** P.P. Will operate on ONE cell.

BERKELEY MODEL SUPPLIES

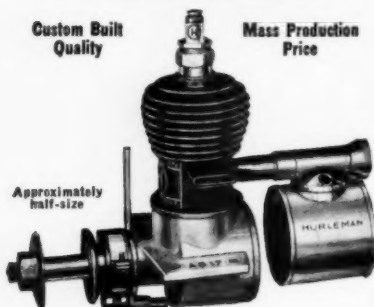
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DEPT. U-47

230 Steuben Street

BROOKLYN, N. Y.

A NEW HIGH IN POWER!



The New HURLEMAN ARISTOCRAT MOTOR

★ The Hurleman Aristocrat Motor is definitely a custom job, with *plus*-performance built into every single part. Standard equipment includes Hurleman Circle H two-piece spark plug with pointed electrodes; special Hurleman timer that provides perfect ignition at top speeds with adjustable tungsten breaker points; new style carburetor with metal tank; Circle H ignition coil with special mounting clip; and condenser. PRICE: complete and ready to run, \$21.50. Never sold knocked-down or in parts.

Replace Defective or Inefficient Timers with HURLEMAN IGNITION TIMERS

For superior performance on all makes of motors, replace original timers with the Hurleman. Interchangeable with factory equipment on all Brown model engines—no alterations required. Easy, safe adjustment. Tungsten breaker points can't work loose. Breaker spring guaranteed to hold tension. PRICE, \$2.50.



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Carburetors (Glass Tank).....	\$2.50
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Circle H Spark Coil.....	2.50
Aristocrat Ignition Unit.....	4.50

All prices F.O.B. Phila., Pa.

Write for descriptive literature. Enclose 3c stamp to cover mailing.

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Discounts assure you extra profits on Hurleman products. Write for details.

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and North American will get ships there in time. Others say that Curtiss has withdrawn their entry which was an improved version of the YA-18. Other eliminations are said to be Bell and Brewster. Bell has something on the fire, so it is said, with Allison X-type engines and it somewhat resembles her twin-engined fighter except a nose wheel is used. Not much has been learned of the Brewster twin-engined attack-bomber nor of Martin's ship which is said to be more than just talk. Martin is now working on a \$500,000 experimental job. Another story is that it is not likely that Lockheed will enter her attack-bomber though it just about fits the specifications. From present information it appears that the dark horse, Stearman, is definitely in the competition, and in all probability it may incorporate the individually mounted ailerons and flaps which Stearman has been working on. As a conjecture we pick North American to win with their sleek airplane.

Though we cannot disclose at this time performance and other details of the attack-bombers, following are some interesting figures on Lockheed's new bomber for export which closely parallels those of the U.S. Army Air Corps prototypes.

The Lockheed B-14

Condition	Gross Wt.	Fuel	Power	Range	Bomb Load
Normal	17,300 lb.	644 g.	50 %	1950 mi.	1744 lb.
Overload	19,000 lb.	500 g.	50 %	1505 mi.	4281 lb.

N.A.C.A. airfoil—23018-06; Wing span—65' 6"; Wing area—551 sq. ft.; Mean aerodynamic chord—115.84"; Horizontal tail area—134 sq. ft.; Vertical tail area—64.1 sq. ft.

Specifications with Wright 1830-SCG engine (over 1400 hp.)

	Normal	Overload
Weight empty (lb.).....	10,750	10,750
Useful load (lb.).....	8,750	8,250
Gross weight (lb.).....	17,500	19,000
Top speed at 12,000 ft.	260 m.p.h.	257 m.p.h.
Landing speed.....	70 m.p.h.	70 m.p.h.
Cruising speed at 50% at 17,000.....	195 m.p.h.	190 m.p.h.
Initial rate of climb.....	1,540 ft./min.	1,300 ft./min.
Climb to 10,000 ft.	8.4 min.	10.1 min.
Single engine ceiling.....	10,700 ft.	8,200 ft.
Absolute ceiling.....	26,000 ft.	24,100 ft.
Take-off with flaps.....	270 ft.	1,070 ft.
Endurance with 644 gal.	9.1 hr.	9.1 hr.

The Lockheed B-14 can carry two 1000 pound bombs externally and two 500 pounds internally. The guns consist of one in the bow with 1,200 rounds of ammunition, one tunnel gun (aft in the belly) with 800 rounds and the rear gun with retracting turret and 900 rounds of bullets. All are of the .30 caliber type.

It may be noted that a very large horizontal surface area is present on the Lockheed. This is because the Fowler flap causes very heavy loads on the tail. Thus where some advantage is gained by the use of Fowler flaps, there is also a lesser disadvantage of having to enlarge the tail surfaces. The N.A.C.A. has developed a large slot that extends forward of the leading edge as well as the flap that slides aft and therefore the moment caused by a flap like the Fowler is reduced and the horizontal tail surfaces may be again brought back to normal. . . . The Fowler flaps are said to be used also on Lockheed's twin-engined interceptor.

Bids were opened March 1st on training planes, and it seems as though "everyone and his grandmother" has offered something. The planes as we understand it are for use in the government-proposed training of 20,000 pilots each year. About six different designs from the manufacturers' contributions will be accepted in order to dis-

tribute the business throughout the industry. Likely contenders are Phillips, Harlow and possibly Laird. The Timm Aircraft Corporation recently leased the former Bach factory where those famous Bach tri-motors were once made. They are keeping their repair base at Grand Central Air Terminal in Glendale, California, and are equipping the newly acquired plant at Van Nuys, California, with the latest in tools and machines. Included in plans is the erection of a building for drop hammers. The company plans to put their twin-engined transport on the market and is also working on a 100-150 hp. and a 250 hp.—plus trainer.

During tests of the new Phillips Ranger-powered trainer the aileron dynamic balance was torn loose and went through the wing, thus delaying its trip to Dayton for further testing. The airplane resembles the former Aeroneer except that it has a new wing and the tail has been redesigned. Their little two-place Menasco biplane may also be made available with a radial engine in the near future, perhaps a Kinner engine.

Max Harlow who built the PJC-1 sportplane is now making a training version of this plane with pilot and student sitting in tandem. This seems to be going backwards for most manufacturers are striving to substitute tandem arrangements with side-by-side seating.

Mattie Laird, known throughout the world for his famous racing planes, is entering the sportplane field with two and three-place monoplanes. He, like Harlow and Timm, has acquired a new plant to go into production.

Dart, who purchased the design of Monocoupe's small two-place low-wing cabin monoplane, is designing a new version with a 145 hp. engine. The present one boasts of a 90 hp. Lambert. The Allied Aircraft Corp., a \$225,000 concern, has purchased a new plant in Buffalo, N.Y., and will build low-wing ships.

One of the more interesting new companies is the Engineering and Research Corporation with their brand new plant in Riverdale, Maryland. Their products go under the trade name of "Erco." Mr. Weick, formerly with the N.A.C.A., is one of the officers in the company and Mr. Henry Berliner is president. The company makes sheet-metal working and riveting machinery for aircraft work, auxiliary power-plant engines and propellers . . . controllable, adjustable and constant speed. One of their propellers, said to have a diameter of about 17 feet, has been submitted to the Army Air Corps for tests. It boasts mainly of very light weight. The Erco propellers are designed from the German Schwarz patents and are of composite wood and plastic construction.

Another Erco product is a two-place, side-by-side, low-wing cabin monoplane with nose wheel. The airplane is powered by an engine designed by Harold Morehouse and is very clean in design. Of especial interest are the double rudders as on the Lockheeds. The ship is of all-metal design except for the fabric covering on the wing. Powered by a 60 hp. engine it does 100 m.p.h. and sells for \$2,500.

Lloyd Stearman, for which the Stearman planes are named, has formed a new manufacturing company and will go into the development of light transport planes.



SAY FELLOWS:

BUYING A **MODELRAFT** KIT WON'T NECESSARILY MAKE YOU A CHAMPION - BUT IT WILL GIVE YOU A BETTER SHIP THAN A GOOD MANY OF THE CHAMPS ARE FLYING. ALL MATERIALS USED IN BUILDING **MODELRAFT** SHIPS ARE SELECTED AND MANUFACTURED UNDER MY PERSONAL SUPERVISION. IT IS MY EARNEST ENDEAVOR TO FURNISH ONLY UNIFORM QUALITY, PROVED AND TESTED MERCHANDISE IN ALL **MODELRAFT** PRODUCTS.

Barney Snyder



MISS TINY

HOW IS THIS FOR PERFORMANCE? At Orange Cove, California, January 25, 1939, 28 minutes and 10 seconds on a 29 second engine run. At Los Angeles, February 19, 1939, 25½ minutes on a 22 second engine run.

A pocket edition of the Pacific Ace, 46" constant cord wing, for Ohlsson 23, Phantom and other ½" engines. Wing span, 46". De Luxe Kit contains spun cowl, silk, 2½" Volt Air Wheels, cement, dope, die-cut ribs, plenty of good balsa, and full size plant. Price **\$3.95**

Standard Kit same, but with bamboo paper covering **2.95**

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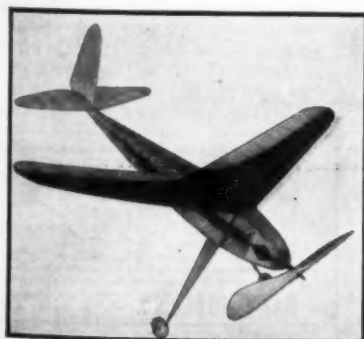
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GOLD SEAL
For that extra margin of performance.

SPECIFICATIONS
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MODEL "23"

Choke-full of power, speed and stamina.

SPECIFICATIONS

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Bare weight 4½ ozs.

Height 3 5/16"

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1/7 H.P. 6500 R.P.M. Weight bare 3½ ozs. Runs upright or inverted; fully assembled; complete with coil and condenser.

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From the raw wood to the finished article with mechanical precision, adjusted to the most exacting requirements. Only through the perfection of an ingenious propeller machine are we able to supply super finished propellers at the unheard of price of 25c—stock up now—carry a dozen extras in your tool box. Complete range of sizes, 9", 10", 11", 12", 13", 13½", 14", each **25c**

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55 Minutes on a 30 Second Motor Run!

New throughout, with latest improvements in design and construction. Flying weight 3 lbs., 4 oz. Wing span 66 in., tapered from 12 to 5½ in. De Luxe Kit contains tapered spars, beveled and tapered trailing edge, die-cut ribs, turned aluminum cowl, 1 qt. gas dope, 1 pt. cement, 3½ yds. super silk, formed landing gear, 4½ in. inflatable air wheels, dural wire, alum. tube, washers, bolts, haskalite, dural sheet, hook up wire, switch, selected hard balsa, full sized, black and white plans **\$8.50**
with test flight instructions, complete
Standard Kit with bamboo paper, ½ pt. of **\$6.25**
dope, 1 pt. of cement and 3½ in. air wheels
Dry Kit same as above without cement, **\$4.75**
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Plans only

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DELIVERS
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G-9

Complete, mounted on test block, with Champion Spark Plug, coil and condenser.
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Built for hard, fast work—not looks—no fancy gadgets for eye appeal. Just careful, accurate machining for stability and power!

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REARWIN SPEEDSTER

64" wing span—1/8 original size

COMPLETE KIT \$4.50

(Absolutely everything!)

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Only Model Including Fully Finished Notched and Webbed Paulownia Wing Ribs—for maximum lift; 5-24"x36" Sheets of Famous PERVEL; Movable and Controllable Ailerons, Elevators and Rudder; 3" Puncture Proof Cork-tired Aluminum Balloon Wheels, 1 1/4" Cork-tired Aluminum Skid Wheel 4 oz. Can Impure Cement, 4-oz. Can Clear Dope Two gas props, one for flight, one for bench testing of motor.

Finest Quality Hard, Medium and Soft Balas, Brass and Copper Hardware, Aluminum Tubing, Round Bamboo, Cement and Stripping Brushes, Paints Colors and Sides fully cut. Hard Bass Wood for special parts, with two sheets of full-size plans (22" x 50" and 16" x 50") also printed in eye-catching green ink on heavy paper with separate instruction sheets all drawn and redesigned by an aeronautical expert and war-time flyer.

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MADE IN U.S.A. PAT. 221

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"THE TEST PILOT PROP"
Use these inexpensive props for bench-running your new motor, test hops, etc.

12"—12 1/2"—13"—13 1/2" **25c**

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PLUS 5c POSTAGE

Our GA- or GB-13 Cherry wood prop., especially designed for G-9 flights. Unvarnished EACH.... **50c**

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With all these new companies and new planes we should see many new design features in the near future. Over in England Short Brothers, who build those four-engined Empire boats, are busy at work on three giant landplanes which will eventually go into service on Imperial Airways routes.

As we go to press Douglas has brought their DC-5 out of the factory and has begun first test flights. An interesting feature of the plane is that the emergency tail skid is considerably forward of the tail, about midway between the wing and empennage. Because of the curvature of the bottom of the fuselage it touches the ground at that point when the tail is down.

New Type Autogiro Accepted by U. S. Army

The Kellett direct-control autogiro is the only wingless heavier-than-air aircraft being manufactured and sold in America today. Called the KD-1 type by its builders, the Kellett Autogiro Corp., Island Road and Lackcock Avenue, Philadelphia, this craft is in the forefront of world autogiro progress.

The ship is a two-place, wingless autogiro, powered by a 225 hp. Jacobs L-4 engine. It weighs 1545 pounds empty, has a maximum useful load of 855 pounds. It carries a maximum of 49 gallons of fuel and 4 gallons of oil. Maximum speed is in excess of 125 m.p.h. Like all modern autogiros, it is suspended in flight by an overhead, three-blade rotor system, which revolves when taking off or in the air. There are no wings. A propeller very similar to the customary type provides forward power. A small rudder rudimentary tail aera complete the control agencies. It is constructed of a tubular steel fusilage, fabric covered.

The Kellett autogiro combines safety factors while in flight, take-off and landing abilities and general ease of control which exceed any similar qualities possessed by conventional airplanes. It can land in any clear area 50 feet square. No forward speed is necessary for the landing operation. Take-off can be accomplished by experts under favorable wind conditions with a run of 25 to 50 feet. Direct "jump" take-offs have been made in high winds. The giro can climb 1000 feet per minute in flight. The minimum speed of an autogiro in still air is about 15-20 miles per hour. With a head wind of that or greater intensity, the craft can hover over a given spot without appreciable motion.

Descent with or without power may be nearly vertical or in a long glide. Forward roll on landing is a few feet. The giro can alter speed at will from zero to maximum. It turns and maneuvers readily and sharply with perfect safety. It can dive or loop but it is impossible to throw the ship into the dangerous, often fatal, airplane stall. The principle of folding rotor blades—making the KD-1 a "roadable" giro—permits it to operate as a land vehicle with little or no difficulty, taxiing on clear surface or roadways.

The autogiro flies by means of its rotor system, which is propelled by the forward, upward or downward motion of the ship. It functions in flight without any motor connection. However, the autogiro's peculiar take-off ability originates directly

through power supplied to the rotors from the engine. A clutch is engaged by the pilot, setting up a driveshaft operation which turns the motor at a high and lifting speed before any slip-stream motion is begun. Once in the air, the motor connection is freed by the pilot.

Well, see you next month with more "Frontier" news!

Elements of Model Plane Radio Control

(Continued from page 7)

tion. Means to do this are shown in Fig. 1-C. Here the same motor as that shown in Fig. 1-B is used, but means of quickly reversing it is provided by the so-called stepping or sequence relay. A series of dots sent to the receiver will cause the solenoid of this relay to pull in its core at every dot, advancing the toothed wheel one tooth each time. Since there are eight teeth on this wheel and four "highs" on the attached cam, the double pole double throw switch will be in first one position then full over to the opposite. The switch has no intermediate open position, and none is needed. The current to the motor is also controlled by the contacts at the rear of the solenoid. When the latter is fully operated, contacts "Y" close to set the motor in motion. In this system the motor runs right and left in sequence with each dot received. However, if the motor has been turning in one direction and it is desired to continue rotation in the same direction without reverse, two dots are sent close-spaced, thus passing the sequence relay rapidly through the reverse position and bringing it back to position for further rotation in the original desired direction. The change is made so quickly that the motor hardly revolves in the undesired direction.

The latter system may be used with either a so-called universal motor (one with a wire wound field coil) or with a permanent magnet one. Connections for reversing the latter are shown in Fig. 1-D. There seems to be little choice as far as weight goes, but the permanent magnet job offers the advantage of simpler connections. The motors of both types that are made for model railroad use offer the best possibilities as they are very light and small for the power delivered, and may be had in many sizes. Very little power is required; the large gear ratio needed to slow down the high speed



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Set of 4 wheels—complete with dust cap—postpaid insured. Foreign countries \$3.15. Dealers Write—**MODEL PARTS MANUFACTURING COMPANY** 218 East 120th St. New York

Here's the line for 'thirty-nine!

The Brown Junior Motor Line-up
Looks Better and Is Better Than
Ever! See These Great Motors Now!

\$ **12⁵⁰**



The New MODEL B

The last word in precision-made gasoline engines for model planes. Special steel cylinder and piston individually fitted make the Model B truly a precision-built job. Transparent, unbreakable fuel tank. Cadmium plated. Mounted on skids ready for operation.

Price complete,
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ready to run

The Amazing New BROWN MODEL D for 1939

More value for your money! Precision-made in the world's largest and most completely-equipped plant devoted to the manufacture of model gas motors. The 1939 Model D includes the sound engineering advances used in other Junior Motors. *New and improved timer!* *New chrome molybdenum crankshaft!* *New micrometer needle-valve!* *New transparent gas tank!* Motor shipped ready-to-run, complete with coil and condenser.



The New MODEL M

The latest power unit for model cars and marine use. Includes Aluminum piston and special rings, combination fly wheel and cam washer for high speeds on open type high speed hulls; new timer, new micrometer needle-valve; new transparent unbreakable gas tank.

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\$16.50

The New MODEL C

Combines power, durability, and light weight at a medium price. Identical in every respect to the Model B except for Aluminum piston and special rings. The new timer in this and other 1939 Brown Motors gives positive contact at the points, and may be rotated from 180° to 360° to get it in any position.

Price complete,
\$18.50



All motors include spark plug, coil, and condenser. Factory block-tested and fully guaranteed. Bore, $\frac{1}{8}$ ". Stroke, 1". Weight (bare) $6\frac{1}{2}$ oz.



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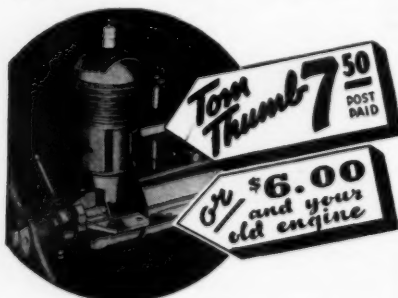
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SPECIFICATIONS and HOW to BUY the NEW TOM THUMB

The Tom Thumb is the most powerful easy starting 1/5 H.P. engine made. Clip the coupon below, enclose money order for \$7.50 (also your old motor for special \$6.00 offer), and receive a brand new assembled and block tested Tom Thumb. Complete with fuel tank, coil, Champion spark plug, one piece cylinder and head and other modern features. Complete flying weight 10 oz. (less batteries). Bore 7/8"; Stroke 3/4".



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motor to a speed suitable for rudder operation also steps up the motor power in the same ratio, so that the smallest available motor is powerful enough for the average sized plane. Among the suitable motors are those made by Knapp and Pittman for HO gauge model railroad use. These weigh about two ounces and a complete gear train with the Knapp motor as shown in Fig. 4 weighs only 2-3/4 oz. This motor operates reliably and with plenty of speed and power on 3 V. with a current drain of .2A. It will work on only 1-1/2 V. but is not considered reliable enough when starting under load.

There are many other sources of motors, some constructors having used those taken from auto horns. Quite a range of miniature motors is also made for use in remote control radio broadcast receivers, some of which are very adaptable to our particular purposes. Everything considered however, the model train motors are probably most satisfactory. While on the subject of trains, it may be said that they also use sequence reverse switches, some of which, especially in the tiny HO gauge size, are highly adaptable to our uses. The solenoid coils will probably have to be rewound for this use, however.

The ultimate in control systems is shown in Fig. 1-E in which instantaneous non-sequence operation of the motor in either direction is possible. This requires (for simplest connections) a motor with a double field coil. Most any motor may have the field rewound for this use. Two field coils, one over the other, but wound in opposite directions are required. The main disadvantage of the system in Fig. 1-E is that two receivers and two transmitters are required, although common power supplies can be used at both ends.

A circuit of similar capabilities to that of Fig. 1-E is shown in Fig. 1-F. Here any motor may be used including the permanent magnet type, but double throw relays are required. Since most available sensitive relays are made this way, the circuit is one of wide application and probably superior to Fig. 1-E, since the motor may be of any construction.

Another popular control system is driven by the power of twisted rubber bands. Only a single magnet or solenoid is needed in addition to the usual sensitive relay. A so-called escapement is used so that each dot received allows the control disc to revolve a quarter turn. A complete description of this equipment appeared in the January 1938 issue of this magazine and the prospective reader is urged to study it carefully. The advantage of this control is that ample power in the form of twisted rubber bands of light weight is available for control surface movement. Also that the electrical equipment is simple and relatively fool-proof. The main disadvantage is that only one degree of movement is possible. The fact that it is a sequence operated system is of no great consequence, as the control may be "snapped" through undesired position by means of a rapid series of dots.

Spring clock motors may also be used for control purposes. A lever is soldered to the second hand for connection to the control surface, and the last wheel in the

gear train before the balance wheel is turned down on a lathe or in a drill so that all teeth are removed and a smooth rim left. This wheel is the one which has ratchet teeth on it. A very slight pressure on this wheel will "stop the works" even though the spring be fully wound up. We may utilize this fact by having a small magnet connected in the circuit of I-A with its armature held by a spring against the wheel. A very small magnet with a single pen cell should suffice; in fact, it would probably be possible to utilize the motion of the sensitive relay armature itself. At any rate, the degree of control possible is that shown under Fig. 1-B, and the extreme simplicity of the system makes it of considerable interest.

The final control system we should mention is that in which an audio modulation is sent over a steady carrier wave, different tones operating different tuned reeds in the receiver, thus allowing many control elements to be worked with a single channel receiver. This requires considerable skill on the part of the builder, and while a properly operating system should approach the ultimate in its degree of control, it is certainly not a project to be tried by the uninitiated or the beginner.

This about covers the practical controls now available, although there are probably many ingenious combinations possible with those shown, and who knows but that some ambitious experimenter will work out something entirely different that will give us selective right or left control of any degree desired and all with ex-

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Guaranteed To Work!

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Weight: 4 oz. with tube less battery—16 oz. with special 10 oz. battery—

Identical kit less tube and battery at \$9.50
Bulletin 212 on Radio Control sent on Request.

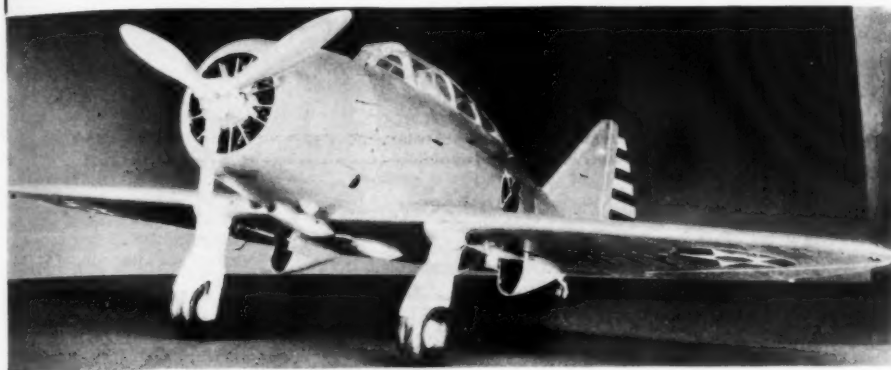
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Enclosed find: \$14.95 for complete kit. \$9.50 for Kit less Tube and Battery. \$3.50 for 10 oz. Tube. \$2.50 for 10 oz. Battery. Please send Bulletin 212.

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Seversky P-35—Curtiss F11C4—Boeing B-17
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This is a large powerful looking exact scale model of one of the Army's fastest fighters; every minute detail is incorporated in this model. Const. Set contains a 10" 2-bladed steel type flying prop, also parts to make 3-bladed prop shown. 2" balsa wheels, tail wheel, insignia, celluloid rubber, 3" turned balsa motor front, all other parts printed on balsa. Construction Set Complete in Labelled Gift Box, postpaid.

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44" Span, Length 30", Weight 8 oz. Color, Silver

This is the only scale model of this plane in the world, and a sensation to look at. Set has all parts printed on balsa, 4 turned balsa motor fronts, 4 carved steel type props, celluloid wheels, rubber motors, 3 oz. silver paint, 1/2 oz. black, 2 oz. glue, etc. Full size large scale drawing, and all parts to build. Const. set in labeled box, postpaid.

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30" Span, Length 38", Weight with motor, 1 1/2 lbs.

A real scale gas model with top performance. All parts printed on balsa, set of colored paints, insignia, tail wheel, etc. Model uses small Ohlsson "29" gas motor.

NEW
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34" Span, Length 17", 3/4" Scale

Set has 7" prop, turned motor front, wooden wheels and complete set of paints. Postpaid.....\$2.50

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Set has 3" celluloid motor, 3 1/4" tapered aluminum cowling, paints, etc. Postpaid.....\$3.75

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22 1/2" Span, Length 14 1/2", 3/4" Scale

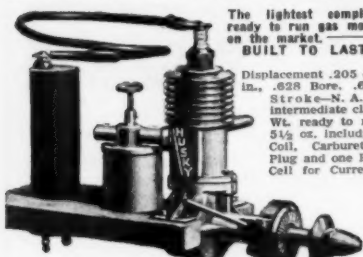
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The lightest complete
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on the market.
BUILT TO LAST

Displacement .205 cu.
in., .628 Bore, .640
Stroke—N. A. A.
intermediate class
Wt. ready to run
5 1/4 oz. including
Coil, Carburetor,
Plug and one Pen
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Husky motor mounts, wt.
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Husky complete ready to
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GLIDE and M & M Model Wheels for smooth landings.
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THE METEOR



NEW CONTEST GAS MODEL

SPAN 66"—Length 45"—Weight complete 2 1/2 lbs.
Performance and durability were the keynotes in the design
and construction of this amazing flyer. Every desirable
feature including simple construction, smart appearance,
and inherited stability. This kit is unsurpassed in con-
tents and money value.

Kit 100% complete with full size plans, selected gas
model balsa. Formed landing gear, ready-shaped and
notched wing ribs (Grant). Firewall, wing and tail out-
lines, motor mounts and nose cowlings are cut to shape.
Cement, dope, paper, etc., are all included in this amazing
kit. Complete kit (less propeller and
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With Brown D Motor, airwheels, timer, 2 bladed propeller
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Complete stock of all motors and gas model accessories.

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treme electrical and mechanical simplicity? It is with the hope of stimulating some such development that this article is presented, rather than just to provide something that may be copied exactly. Most builders have ideas of their own but are often stuck on some of the details. Well, work them out, gang, and let's see who comes along with the "perfect" control system.

The next topic we must consider is that of receivers which supply the varying current that operates the sensitive relay.

The ultimate in this line has been closely approached by the use of a new tube called the RK62 and produced by Raytheon. It is similar in size to a type 30 and when operating properly can produce an 8 to 1 (or more) drop in plate current, the change running from a little over 1 milliamperes to as low as 0.1 ma. The circuit is shown in Fig. 2-A and the constants shown were found to produce the best all around operation. The most important control aside from the tuning condenser, C-1, is the variable resistor, R-2, which controls the plate current and the general action of the tube. If too little resistance is used here the plate current will not give sufficient dip when a signal is received; while if too much is used, the plate current will not restore to its original value when the signal ceases. The filament rheostat, R-3, also has considerable effect on the action, although the tube may be operated directly from a 1-1/2 V. cell, dispensing with R-3 entirely. Condensers C-1 and C-2 are the so-called trimmer variety and have a range of about 3-30 mmf. C-2 should be pretty nearly full open while C-1 must of course be tuned to the desired signal. Enough turns should be used in L-1 so that C-1 is at quite low capacity, as high capacity here makes for inefficient operation or even a total lack of oscillation.

The only sensible way to tune this receiver is to insert a 0-1.5 ma. meter in the circuit in the pin jacks shown. A higher range, up to perhaps 0-5 ma. may be used, but the lower value is best. With a meter it is easy to tune the receiver to exact resonance, something that cannot be done by watching the relay or by the use of headphones. Figure 5 shows an experimental receiver built with the RK62. The filament is heated by a single large flashlight cell, while a ten ounce Burgess type W30BP 45 volt battery supplies the high potential. A flashlight bulb may be seen at the rear of the flashlight cell, and it is connected to the contacts of the relay so that when a signal is received the bulb lights. This is a great aid in working with the receiver at a distance and every constructor who wishes to use this system is urged to familiarize himself with tube and circuit operation by construction of such a unit. The filament rheostat, R-3, is seen fastened to the tube socket while R-2 is controlled by the knob near the relay. The tap on L-1 from the choke RFC should be tried on different turns, but in the case of this receiver it was found to work best near the grid end. The antenna tap should be one or two turns nearer the plate end.

The equipment shown, less the meter,

weighs 22 oz. including both A and B batteries. The receiver alone, together with its sensitive relay, weighs about eight ounces.

For those who prefer more conventional tubes, the circuit of Fig. 2-B is recommended. This circuit produces a plate current increase, the current running about .4 ma. with no signal and 1 ma. with signal. The circuit is not as tricky to get into satisfactory operation as that of Fig. 2-A and is very reliable in operation. The RK43 dual section tube is used as a combined super-regenerative detector and first audio amplifier. An RK42 serves as the output tube, and has an unusual grid circuit connection. The tube operates much the same as an ordinary grid leak detector, to produce the plate current change. ILLUSTRATED IN FIG. 6.

It is desirable to substitute the sensitive relay with a pair of headphones at X-X to check the operation of the super-regenerative detector. The same comments that were made on circuit 2-A as regards tuning hold here. The input inductance, L-1, should be such that at resonance C-1 is at a low capacity setting. Also C-2 should be at a low setting. This provides loose coupling and produces the maximum amount of "rush" in the headphones with no signal. This rush is what causes the plate current in the RK42 to drop. When a strong signal comes in, the rush stops, and the plate current of the latter rises. After the input circuit is properly adjusted, the relay should be put back in circuit, and a low range milliammeter put in the circuit at X-X so that tuning of C-1 and C-2 can be accomplished most efficiently.

The transformers, T-1 and T-2, are of the midjet replacement type, the cores of which are removed, and all but the center tongue sawed off. When reassembled the transformers will weigh less than half

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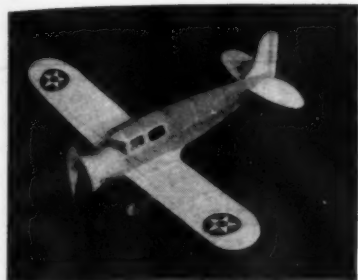
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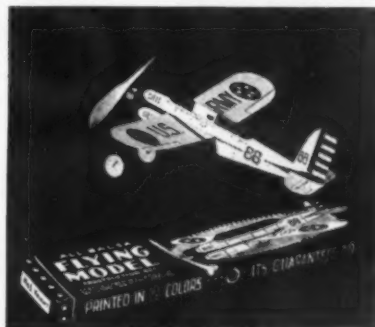
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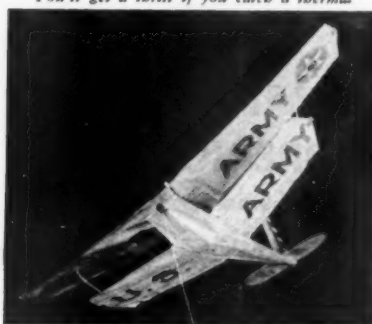
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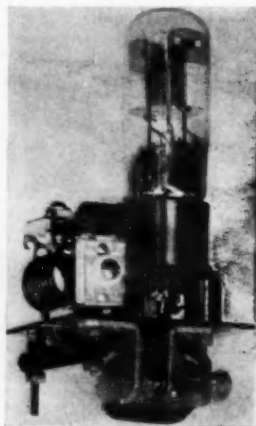
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what they did and will be more suitable for this particular service. This receiver complete, less batteries, weighs fifteen ounces.

In an effort to cut down weight, circuit 2-C was tried out. Although it is quite a bit more critical than 2-B it offers possibilities for the experimentally inclined. Since only one tube and one transformer are used, the weight is only about half that of circuit 2-B.

With the circuit as shown the plate current of the A.F. section dropped from .6 ma. to .1 ma. when a signal was properly tuned in. No rush could be heard on headphones with no signal coming through, and it is not known just what circuit action was taking place. Condenser C-4 seemed to be the deciding value for proper operation and different values should be tried.

Incidentally, it may be mentioned that type 30 tubes may be used in place of the RK42 and 43 where the latter are not available, although this naturally means some complication in the filament circuit to supply the 2 V. that the former require. Also one more tube is required in both the 2-B and 2-C circuits when the 30's are used.

The question of a suitable transmitter has been given much thought by the writer. Of course, a simple self-controlled oscillator will be quite flexible in operation and can cover quite a band of frequencies. This fact is just what makes it doubtful that a self-excited job is best for the purpose. It seems that it would be best to have the transmitter set on a definite fixed frequency, so that careless handling could not cause a loss of control due to change of transmitter frequency. The requirement of fixed frequency should not alarm the prospective builder, however. Now that 10 meter crystals are available a simple crystal controlled M.O.P.A. transmitter may be built with hardly more parts than a single tube self-excited oscillator requires.

An effort to build a practical job for this use is shown in the Figs. 7, 8 and 9 and in Fig. 3. It will be seen that this is a complete M.O.P.A. using only a single RK34 tube. Changes in capacity of C-2

or C-3 such as would be made when setting up a new antenna have only the very slightest effect on the overall frequency of the transmitter. With a job of this kind it is impossible to lose control of your model even if some well-meaning friend tries to "tune up the rig" when your pride and joy is in the air. Resetting of C-1 and C-2 and observation of the meter reading will enable you quickly to get back "on the air."

If built as shown there should be no trouble whatsoever in getting proper operation. With the parts specified the high voltage under load should be between 325 and 350 V. and with 40 ma. plate current on the amplifier section (right hand) of the tube, approximately five watts output will be available. This is plenty for very satisfactory control at reasonable distances.

The switch SW-1 enables one to read plate current of either section of the RK34. It is always set for amplifier current except when doing preliminary tuning, and at no time should either section of the tube be allowed to run with a steady plate current of over 40 ma. The amplifier is of course working as a doubler and L-2, C-2 is tuned to five meters; if L-2 is the proper size C-2 will cause resonance at about 1/3 full capacity, while C-1 will be set somewhere near midscale.

The usual antenna is a collapsible rod attached to the insulators on the panel. This rod will extend to around six feet in length for proper operation. When C-3 and the tap on the coil are correct and the rod is of the right length, the tuning of C-2 will not need changing when the rod is attached or removed, although the plate current will naturally change. With proper tuning the plate current will go from 22 ma. with the rod disconnected to 40 ma. when it is in place.

Any sort of control button or key may be plugged in the jack K, but it should be well insulated from the hand.

A short description of the sequence relay and the motor drive shown in Fig. 4 may be in order. The relay is operated by a solenoid which is wound on a brass tube 5/16" inside diameter and with a winding length of one inch. The form ends are 7/8" in diameter and the spool thus formed is wound full of No. 26 DCC wire, which will give a resistance of around 6 ohms and will draw about 750 ma. on 4.5 V. The core is an iron piece 1/4" diameter by 7/8" long, soldered to brass rods which support it in the center of the solenoid. A very light spiral spring keeps the core pulled out when no current is flowing.

The core rod has a thin bronze spring soldered to it, the hook-shaped end of which engages in the teeth of the brass wheel. Another spring pressing on the edge of this wheel prevents it from rotating in the undesired direction. As there are eight teeth, every pulse of current through the solenoid produces an 1/8th of a full turn. A four-lobed bakelite cam is fastened to the underside of the toothed wheel, and when turned, causes the D.P. D.T. switch to be set alternately one way, then the other, with no center position. Thus the motor rotates in a different direction at every pulse through the

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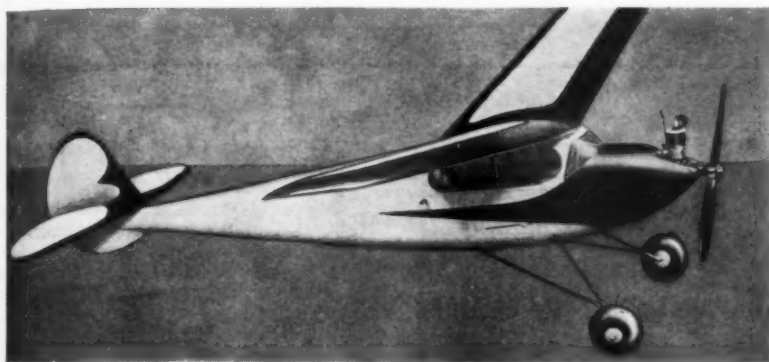
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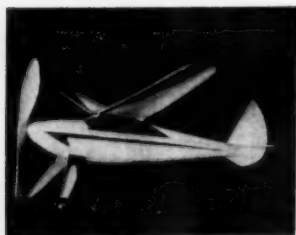
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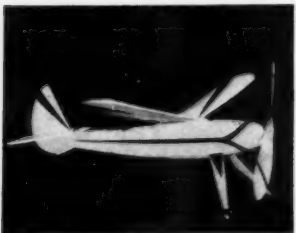
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solenoid. At the rear of the latter are the contacts Y shown in Fig. 1-D.

It is necessary to have a closed magnetic circuit around the solenoid to get proper operation. Therefore the strip that supports it is iron and is soldered to the brass tube before the winding is begun. Also an iron strip runs under the solenoid and up on the cam side, where a hole allows the core to pass through.

Although this unit takes considerable current, it is only on for a fraction of a second at each pulse, so battery life is quite good. Naturally, the pull is quite small so only the thinnest springs should be used for both the D.P.D.T. switch and for contacts "Y," those shown measuring about .0007 in thickness. Also all parts must move without the slightest unnecessary friction. The sequence switch as shown weighs 4-1/2 ounces complete.

The tiny Knapp motor in Fig. 4 has a worm wheel soldered to its shaft which, with the gear supplied, gives about a twenty to one stepdown. The gear wheels shown, which were taken from an alarm clock, raise the overall ratio to 450 to 1. This gives a complete revolution of the control arm in ten seconds. The gears and motor are mounted on a thin wall brass tube of 7/16" by 9/10" cross section and the whole unit weighs 2-3/4 ounces.

In practice the solenoid is run on three flash cells, while the motor is tapped across only two. The filament of the receiving tube may be heated from the odd cell to equalize the drain. The total weight of a complete control including a Burgess W30BP battery, three flash cells, the

RK62 receiver (Fig. 2A) and the sequence control of Fig. 1-D, is about two pounds three ounces.

Parts used are as follows:

Fig. 2: C1, C2,—Hammarlund "Mex", 3-30 mmf.; C3, C6,—Cornell Dubilier 100 mmf.; C4—0.1 mf.; C5, C8,—.005 mf.; C7—.001 mf.; R1, R6,—I.R.C. .5 meg.; R5, I.R.C. 2 meg.; R2—Yaxley Midget 10,000 ohms; R3,—Clarostat 5 ohms; R4,—I.R.C. .5 meg.; RY—Sigma model 2A; M1—Triplett 0-1.5 ma. meter; T1,—U.T.C. type R33; L1,—11 turns No. 14, 3/4" O.D., 1-1/2" long.

Fig. 3: Xtal, Bliley 10 meter crystal; RFC—Hammarlund type CHX choke, 25 mh.; C1,—Hammarlund HF 100; C2,—HF35; C3,—HF50; C4,—Solar 100 mmf.; C5, C6, C7,—Solar .005 mf.; C8, C9,—Solar 8 mf. electrolytic; T1,—U.T.C. type R2; M2,—Triplett 100 ma., rear illuminated, CH,—U.T.C. type R18; Case,—Par Metal Type HC, 788 with chassis; L1, 6T No. 14, 3/4" O.D., 1" long; L2, 5T No. 14 same size.

Gas Lines

(Continued from page 27)

present prosperity of the sport of gas model flying it is essential that during the year model builders take account of their desires in respect to rules, in order that in coming years they may be able to make wise decisions which will govern their activities, and therefore encourage the normal and healthy growth of this remarkable educational hobby.

In order to separate the ideas born of careful thought and consideration from those which are mere feelings, let us consider this matter and analyze it carefully. Snap judgments are often the product of feeling and not wisdom. Obviously rules which have been carefully thought out and the results of which are thoroughly understood are the ones which in the end will prove most satisfactory.

In order to establish such rules the first step that every model builder should take is to determine his objective; that is, what does he want to accomplish? He should analyze this carefully; set down on paper, if necessary, his thoughts concerning this. Then when he has made his decision he, himself, should endeavor to design a rule which will bring about the circumstances which he desires. In order to test this rule and make sure it actually will do the job he wishes, instead of merely guessing as to its function, he should apply it to a specific case and see exactly what the result will be.

What each model builder will want to accomplish will depend upon whether or not he is thinking of his own individual standpoint, or thinking from a standpoint which will benefit all model builders. We believe that the wisest decisions will be those which will give consideration to the welfare of model builders as a whole, and not merely individual selfish interests.

In other words, if every model builder will sit down and decide what conditions he believes will promote model building nationally instead of sectionally, and then design for himself rules which will promote this condition, we believe that not

only the whole fraternity of model builders will benefit but each individual will benefit indirectly from the prosperity of the whole organization. If model builders who are Academy members will follow this procedure, then they will be able to come to Academy meetings with suggestions that will be of help on a national scale and which will promote the normal function of the Academy. Obviously the Academy should express the will and promote the welfare of model builders as a whole and should not handicap the majority because of the desires of small groups interested in their individual welfare rather than the welfare of all gas model builders.

This brings us to another point. It's the duty of every Academy member, whether he is in California, Texas or New York, to attend the Academy meetings in order that the rules which are made will be representative of groups throughout the whole country. Naturally those delegates who do not attend should not complain or feel slighted if their desires have not been carried out. Let us make the Academy a representative body on a national scale. We hope that every model builder will join, get behind it and build its wisdom and prestige by his cooperation.

We feel it would be an oversight not to analyze what the present rules will do for each model builder. After all, when anyone purchases an object he likes to know what he gets for his money.

The new rules, as stated previously, are divided into three classes. Thus small engines do not have to compete against engines of extremely high power. Inasmuch as model builders wish to have as light a plane as possible for the amount of power used, in order that it will have the greatest performance possible, the present rule encourages the use of engines close to the highest displacement limits in each particular group, and discriminates against the use of engines in the lower brackets of each group. Whether or not this is wise is for you to decide.

This rule also encourages the builder to concentrate his attention on building light structures and putting in these structures just as much power as possible. This gives a remarkable performance and helps a boy to understand the technique of structural design.

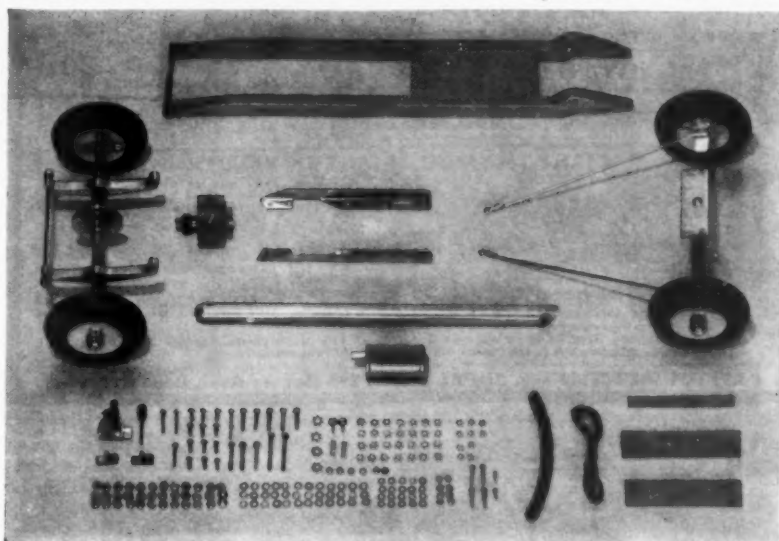
On the other hand it encourages planes of the "skyrocketing" type and ones which will go to pieces in the air, causing possible damage to spectators and model builders. It also doesn't restrict the flight of planes to the bounds of an airport, for, due to their high performance planes will gain a high altitude and glide long distances. This rule concentrates the builder's attention upon structural design rather than aerodynamic design. It is up to the builder to decide whether this is wise or not.

This rule will discourage the building of large planes, whether or not small-power motors are used: Planes which gain their flight capacity from aerodynamic considerations. Let us take an example to illustrate this:

A model builder decides to build a plane in the third category. Obviously he will want the plane he builds to have the highest performance possible. Therefore the first

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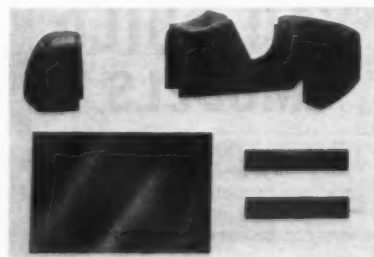


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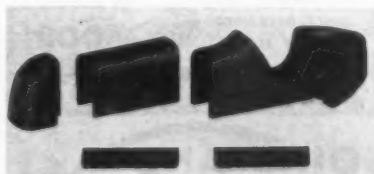
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consideration is that it will have the greatest power and the least weight possible. Otherwise, the power-weight ratio will be high. The least amount of weight is governed by the area of the wing, inasmuch as there is a minimum wing loading. Obviously he will want the minimum wing loading, which is eight ounces per square foot. The plane in this category which will give the minimum weight is one which will have the minimum area—450 square inches. Thus he has a lightweight plane with low wing loading.

The next step for greatest performance is to put the greatest amount of power possible into this plane. To a certain extent this depends upon his ability to build a light structure so that the weight of the plane will be an advantage when equipped with the motor unit. The only limitation to the size of the engine that may be used is the weight of the motor unit in each case. If a designer is clever he may be able to use a Brown or even a Forster, if he wishes to sacrifice his wing loading slightly. He certainly would never be foolish enough to use a motor of 3.1 cubic inch displacement, or even .40; inasmuch as he would be at a disadvantage with other builders who would use the higher powers allowable under such conditions. Thus we see that the lower displacement engines would hardly ever be used provided the model builder knows what he is doing, in respect to getting performance. Nor will he build large, heavy planes when better performance and contest results can be obtained by building light planes with high power.

If these conditions are desired by the majority of model builders, then these rules will be satisfactory. If they are not, then it is up to every model builder to begin to think about this matter and to decide exactly what he does want and what rules will bring about his desires. He will then be ready in 1940, when the new rules are made, to give an intelligent opinion and "do his bit" toward having rules established which express his wishes.

We urgently request every reader to

write to us and tell us the type of ships he would like to build for contest performance, and if possible to submit the rules he cares to see put into effect. Thus Model AIRPLANE NEWS may act intelligently as an instrument for the desires of model builders on a national scale. The sole purpose of this magazine is to carry out the desires of the majority of model builders, and not to promote the welfare of any one particular small group to the detriment of all concerned.

Though model builders have been most anxious as to the form the new rules would take, apparently it hasn't curtailed their activities. Interesting pictures and data have come in to us which we cannot overlook in this column. Picture No. 1, at the top of the column, shows Frank Davis' custom "Cavalier" in full flight. Davis lives in Amarillo, Texas. The model has a nine foot wing span and is powered with a 1/3 horsepower Forster motor. It has made 128 flights so far. This ship is an excellent illustration of high aerodynamic efficiency; it is quite light, has considerable power, yet its graceful streamlines reduce parasite resistance to a minimum. As most of you know, this promotes the soaring qualities of any model.

Another factor which promotes soaring is the high efficiency of the wing; that is, the high lift-drag ratio at its gliding angle. This does not necessarily mean the maximum lift-drag ratio.

Incidentally, recently we have had word from Germany that they have made soaring tests on various types of airfoil and have found that the Grant X-8 has given better results than any other airfoil they have tested. Over a number of trials, a 40 inch glider, equipped with this airfoil, gave an average glide of twenty to one. This explains much of the success that has resulted from the use of this section in this country.

Kenneth D. Hay of 728 East John Street, Appleton, Wisconsin, sends us picture No. 2, which shows a very unique model. Actually it is a stick model though it does not look like one. The fuselage is a built-up stick with a streamlined contour, giving the whole job a neat appearance. This is the first gas job that we have seen built in this manner, though plans of a ship of this type, powered with rubber, were presented in Model AIRPLANE NEWS about three years ago. You will note a three-bladed propeller is used. Mr. Hay says this causes the motor to run more smoothly. The propeller has a radius of 6 1/2 inches, which compares with the 7 or 7 1/2 inches of the usual 1/5 horsepower propeller. The plane has a span of six feet.

Picture No. 3 shows a model which will gladden the hearts of World War-time model fans. It shows a Fokker D-7 gas model. The plane has a forty inch wing span and weighs one pound, fourteen ounces complete. This is one of the most realistic gas jobs we have seen. It was built by John A. Graham of Vista, Calif., who says he has no illusions about its flights winning an endurance contest, but it gives him a great deal of pleasure to see it in the air. It is built entirely to scale and must have "something on the ball" for the ship has flown very well despite the fact the local "experts" predicted disaster for a

get going



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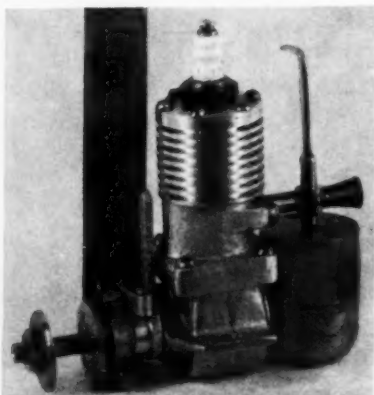
Ivor Schumaker of 1435 Glenville Drive, Los Angeles, Calif., sends us picture No. 4. It shows a low-wing plane designed and built by Dick Sykes of 816 Shenandoah, Los Angeles. In spite of the fact that low-wings usually are not as steady as high-wings, it has turned in over 100 safe flights. You see it posed on Rosamond Dry Lake, Calif. It has a 65 inch span and weighs only two pounds, powered with an inverted Brown Junior, swinging 14 inch propeller. Sykes is only fourteen years of age, but is an active member of the Gas Model Airplane Association of Southern California. This club flies regularly on Rosamond Dry Lake, and is indeed fortunate to have such a fine flying field.

Picture No. 5 shows Bill Johnson of 1035 South 5th, Clinton, Indiana, and his low-wing of unusual design. The chief interest of Mr. Johnson is to build planes which are of unorthodox design. The low-wing which he is showing in the picture, he says, has not flown with the greatest

amount of success. However, he got a great deal of enjoyment out of the experiments which he carried on with it.

In picture No. 6 we see another model which is out-of-the-ordinary. This ship was built by J. Tom Laurie of 1026 Lake Avenue, Fort Wayne, Indiana, and is made entirely of balsa except for the metal parts. The wing is composed of balsa sheet strengthened with ribs cemented to its under-surface. It is 48 inches in span and has an 8 inch chord in the center. Both the wing and stabilizer are of elliptic shape. The balsa in the center is 1/4 inch thick, bent to McBride B7 section. The fuselage is composed of two very hard balsa sticks, each acting as motor bearers. The pylon holding the wing is hollowed out to make room for the coil, timer and batteries. The model is powered by a Baby Cyclone. Laurie says the wings have never shown any signs of washing out under power, and the glide is very flat. The weight is slightly over one pound, even though this may be hard to believe.

Mr. Wallace Ewing of 119 East First Avenue, Mesa, Arizona, sends us picture No. 7, which shows him with his twin Douglas gas model, which is a most remarkable ship. He tells us it took him 3 1/2 months to build and it cost only \$20, including \$10 for a Brown motor. Evidently he had the other Brown motor, for it is equipped with two engines. The plane has a span of ten feet and is 5 1/2 feet in length. Because of its large size, it has been designed so that the rear of the body may be taken off and the wing demounted from the rest of the structure. In order to overcome motor torque the two motors run in opposite directions, and this is a very helpful feature. A simple pendulum control has been incorporated to keep the plane in level flight—and we hope it worked satisfactory, for usually such controls cause a great deal of difficulty and make the plane unstable rather than stable. Mr. Ewing has not tested it thoroughly yet, but he says the glides have shown it to be very stable as the ship



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\$12.45 P. P.

60 inch span. Wt. Approx. 3 lbs. Kit contains
absolutely completed ribs, spars, leading edge, trailing
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Motor whose extra power gives it a breath taking
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built in two evenings as kit is practically pre-
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comes in for a three-point landing.

Ed Hendricks of 1261 Crenshaw Boul-
vard, Los Angeles, Calif., sends us picture
No. 8 of his hydro gas job. The reader
will have to judge its merits from the pic-
ture, inasmuch as Mr. Hendricks sends us
no information concerning his ship. Judging
from its looks, there is no reason why this
ship should not be a good performer.

Mr. Richard Kispert of 4309 Glenway
Avenue, Price Hill, Cincinnati, Ohio, sends
us picture No. 9, showing him with his
ten-foot experimental radio control plane.
It is powered with a Forster engine, weighs
8 pounds, 2 ounces, and has made about
fifty flights. He says the ship flies exceed-
ingly well, which is largely due to the fact
that he is using an efficient radio control
outfit designed and built by Robert Uphaus
of 1614 Tuxworth Avenue, Cincinnati.

NOTICE Insurance

Gas model builders should not forget
that gas model insurance may be obtained
through the N.A.A. This will cost \$1 a
year, and is well worth obtaining. Those
who do so will contribute greatly to the
successful operation of gas model planes
throughout the country.

New York City

With an entry list of more than 100 of
the most active gas model builders in the
Greater New York area, the Metropolitan
Model Airplane Council of 230 Steuben
St., Brooklyn, N.Y., held its first N.A.A.
sanctioned outdoor gas model meet of the
1939 season on Sunday, February 12th, at
Creedmore Field, Long Island, and despite
unfavorable wind conditions some excel-
lent times were made by the contestants.

The large motor event drew the most
entries and after preliminary test flights
it soon developed into a duel between Sal
Taibi of the Sky-Scrapers Club and Henry
Struck of the Queens Model Airplane Club.
Struck, flying a Brown-powered ship of
his own design, a six footer with inverted
motor and single wheel landing gear, got
off first to a flight of 3:18 minutes. Taibi
launched the Forster powered seven-footer
of his own design a few moments later and
did 3:29 minutes. On his second flight
Struck's craft did 5:04, but was washed
out for the day after landing in a tree. Taibi's second flight, the longest of
the afternoon, was timed at 6:04, the plane
flying out of sight over the eastern boundary
of the field.

Due to wind conditions, few flyers com-
pleted three flights. John Tourville of the
Kee Wee Club had three flights in a Brown
powered Heath Monarch, his longest flight
being 3:05. His total time of 4:19 gave him
third place. Magnus Anderson of the Rich-
mond Flying Club of Staten Island, flying
his Brown powered Thor, did 3:49 on
three flights for fourth place and Tony
Bacchi, of the Skyscrapers, did 3:29 on
two flights for fifth place in a Brown
powered job of his own design. Other place
winners in the large motor event were
Edward Beshar, Frank Leghorn, Irving
Pearlman and G. Grathwhol. Beshar,
Pearlman and Grathwhol used Browns and
Leghorn, a Forster.

The small motor event was featured by
the performance of a tiny Buccanneer with

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Motors
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Ohlsson power, flown by Joseph Raspante of the Majestic Model Club, who did 4:48 on three flights, his longest time being 2:07. Raspante was the only man in his class who had three flights. J. F. Condon of the Kresge Aero Club of Newark took second place with an Eaglet powered by a new Bantam. His total time for two flights was 2:17 minutes. Gilbert Rose of the Metropolitan Model League took third with an Ohlsson powered ship and Leon Shulman of the Sky-Scrapers took fourth with another Ohlsson job. Fifth was Philip Sagona of the Sky-Scrapers whose ship was powered by a Phantom.

As first prize winner Taibi received a handsome Council Trophy and a \$5.00 cash voucher donated by Beshar Models. Struck was presented with a special M.M.A.C. Trophy, and a \$2.50 Beshar voucher. Tourville won a Heath kit, donated by Heath Model Airplane Company, and Anderson took home a Berkeley Stop-watch Timer, donated by Berkeley Model Supplies. Bacchi received a knife set donated by Polk's Modelcraft Hobbies Shop, Beshar received a dozen batteries, given by Berkeley, Leghorn won a Polk knife set, Pearlman won a dozen batteries provided by Berkeley Co., and Grathwhol won a Polk knife set.

Raspante won an M.M.A.C. Trophy and a \$5.00 Berkeley voucher for his first in the small motor class. Condon received the Bay Ridge Model Supply Co. Trophy and a \$2.50 cash voucher. Rose won a Heath plane kit, Shulman a Berkeley Stop-watch Timer, and Sagona a Polk knife set.

According to Mr. Irwin S. Polk, President of the M.M.A.C. and director of the contest, the wind conditions prevented the small ships from making their best showing during the meet.

Nearly every club in the Greater New York area, which is associated with M.M.A.C., was represented at the contest. The council has made tentative plans for additional meets in the near future.

Baltimore

The Baltimore Model Airplane Association will hold its second annual gas meet June 4th, 1939, at a field near Baltimore. The contest will be N.A.A. sanctioned.

The events scheduled are: Gas models, large and small bore motors; rubber models, fuselage models conforming to N.A.A. rulings. Prizes are to be trophies, motors, cash, etc. This meet will again have a rubber contest in conjunction with its annual gas meet. Last year it was very popular with the modelers.

Here's a chance to see what your ship may do at the Nationals by flying it in this meet. Full information and entry blanks, can be secured from Len Dorsey, 317 South Baylis Street, Baltimore, Maryland.

Air Ways

(Continued from page 17)

models the flying wires are threads stuck in place. However on this little plane they are made of flat spring steel, ground to size. There are about 980 parts in the entire plane.

In fact the picture hardly does this little plane justice—and this is very often the reason why we implore our "Air Ways" contributors to send us clear, fine

going over **BIG!** **IDEAL'S** replica Moulded Fuselage Kits



CURTIS XP40 • GRUMMAN FIGHTER • LOCKHEED 14

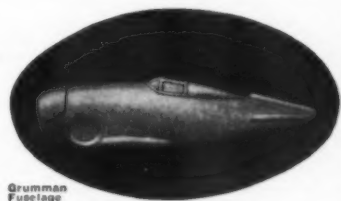
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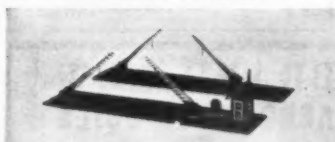


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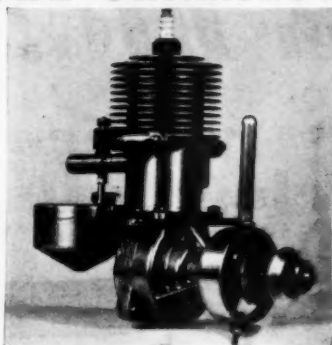
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THE CHAMPION!



Mr. Sal Taibi of Brooklyn, New York, won first place at the "Metropolitan Model Meet" February 12, 1939, with his FORSTER powered 7 foot span, 3 1/2 pound plane. Sixth place in the same event was also won by a FORSTER powered plane, a 9 foot Cavalier. Sixty-five model clubs competed in this important contest! Competition was keen!

Whether your ship is small or large, you can do no better than install a FORSTER motor. It is recommended for planes from 4 to 14 foot wing area. Displacement, .997 cubic inches, 1/2 H.P., bare weight 14 ounces.

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For 1 1/2 Volts—For 3 Volts**

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• A 1 1/2 volt coil

DESIGNED to work perfectly on one standard Battery or pen-lite cells. Save 25% engine assembly weight.

• A 3 volt coil guaranteed by field and laboratory tests to develop a greater heat spark than any other coil in its class.

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photographs and not merely snapshots to which no thought of background, lighting detail or focus has been given. We discard many photographs merely because the photographers do not show up their plane to advantage. This reflects on them as well as the magazine if they are printed. Mr. Erickson has not erred in this respect: the photograph was very fine.

Mr. Lawrence Faulkner of Pleasant Hill, Missouri, sends us a picture of his Wakefield model. It is picture No. 3. He says:

"I designed and built it using Mr. Grant's articles as a guide. It flew out of sight on an unofficial flight of one hour, twenty-one minutes at the 1938 Nationals; and while at home it had made flights of thirteen and four and a half minutes.

"I had another model at the contest that was almost identical with this one, but I was unable to fly it, for by the time I got back to the airport after chasing the first model it was too late. On the way back to the airport with the Kansas City boys, who helped me chase my model, we picked up Jim Cahill's model which won the competition.

"My ship has a span of 44 inches, and over-all length of 40 inches. It is powered by 18 strands of 1/4" flat rubber. The total weight is 8-1/2 ounces; 3-1/2 ounces being rubber. The motor was stretched 18 feet and given 850 turns. The prop duration was 55 to 60 seconds, using an 18 inch propeller which was silk covered. The fuselage was covered with bamboo paper. The rudder area was determined by the cardboard side-view method. On test flights the model swung from side to side (this showed directional instability), so I increased the rudder area until it was just the right size—as the importance of this point was emphasized in the articles on design."

At present, Mr. Faulkner tells us, he is in the engineering school at the University of Missouri and hasn't as much time for model building as he would wish.

Here is another beautiful contest model—shown in picture No. 4. It has a gull wing which is proving to be exceedingly stable, having been flown in all kinds of gusty weather. Joe Walsh of 96 Willis Street, New Bedford, Mass., who built it, says he finds the wide tread of the landing gear improves the take-off and landing qualities. Sixteen strands of 3/16" flat rubber are used. The plane has a span of 48 inches and a complete area of 170 square inches. The dihedral is 4 inches. The Clark Y airfoil is used.

Walsh says that he has noticed a great difference in the performance of Class D and Class C planes of the same design and weight rules. Apparently the small jobs must resort to tremendous climbs with excellent streamlining in order to compete with larger ships.

Robert Bassett of 4600 South Prieur Street, New Orleans, Louisiana, has built a very fine and realistic flying scale model of a Curtiss Hawk. Its flying qualities are demonstrated by picture No. 5. Here you see the little job going places with a form equal to its big brother. The only difference between this and the large scale

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job is an increase in the wing dihedral. The ship has a wing span of 44 inches and weighs slightly more than half a pound. Eighteen strands of 1/8" flat rubber turns the sixteen inch, highpitch propeller. This is a scale job that turns in a real flying performance.

One of the most varied assortments of model types that we have ever seen is shown in picture No. 6. This has about every kind of model that one might wish for: A gas model which has flown five miles on one flight (since this picture was taken), a five inch balsa and stunt plane (of built-up construction) between the wheels of the gas job, and a number of other interesting ships. The little stunt plane does about seven to nine perfect barrel rolls under power, three Immelmans, all in addition to a number of loops and a flight lasting from fifteen to twenty seconds. The top right model is a roto plane. It flies, but only from seven to ten seconds, gaining a maximum of ten feet altitude. The little SE-5 has won every local contest for scale models in the last year and a half, turning in flights of fifty seconds consistently and some as high as one minute, fifty-nine seconds.

This interesting group of brain-children belongs to Arthur Ish of Winters, California.

Model News from Other Countries Holland

We have a letter from Mr. A. Warnaar of Prinses Mariannelaan 36, Voorburg, who is an expert model builder of Holland. He sends us a picture, No. 7, of one of his models. It is a solid scale Fokker G-1, which is very interesting in design and appears quite similar to the latest United States pursuit ship, the Lockheed XP-38.

Germany

Our old friend, Hans Justus Meier of Osterstr. 23, Bremen, Germany, sends us picture No. 8. This was taken at the last German Nationals, and shows one of the model fliers with his flying scale Heinkel He-70. The interesting thing about this plane is the retractable landing gear. The model is hand-launched with the landing gear locked in the up position. At the moment the ship touches the ground at the end of the flight the little "feeler" that extends down below the fuselage "trips" the landing gear upon contact with the ground; the gear dropping just in time to support the ship.

CLUB NEWS Pittsburgh

Mr. Harry G. Vogler, Jr., of 4412 Butler Street, Pittsburgh, Pa., wishes to announce the sixth of a series of WPA-Recreation Park scale model airplane contests. It is scheduled to be held the 15th of April at the Boys Club of Pittsburgh, located at the above address. The entries are to be models of actual man-carrying aircraft. Those who wish to enter should address their models to Mr. Vogler, Director Aircraft Division, Boys Club of Pittsburgh, 4412 Butler Street, Pittsburgh, Pa., so they will reach him by 9 P.M. of April 14th. There will be two divisions in the contest; one for those sixteen and under, and one

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(3 sizes—see below)

SPIN PROOF STABILITY ASSURED BY:

- 1—Wing tips remain level due to new tip ribs which never reach the stalling angle.
- 2—"T" section tail—44% more efficient
- High stabilizer eliminates "blanketing" of rudder and loss of control.

MONOWHEEL landing gear optional on Senior and Super-Senior

NOTE: This picture taken after 73rd flight (all without damage)

Ideal for Radio-Control or endurance

Engines may be upright or inverted

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4 1/2" Airwheels \$1.75 add. Span 10 ft. Length 85". Wing area 12 sq. ft. Use any 1/5 to 3/4 H.P. Engine.

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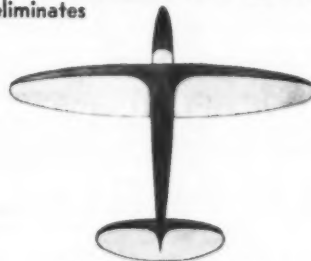
makes all landings smooth—practically eliminates "crack-up" rebuilding (another reason for doubling your flying).

Wing and stabilizer removable
—Free swinging fully protected from all damage.

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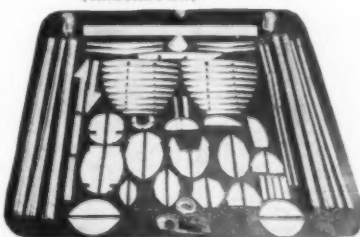
Batteries cushioned with rubber—Ship or parts can not be damaged.

1/8" dia. music wire landing gear—bolted to plywood plate and hardwood rails.



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"Warp-Eliminators" in wing and stabilizer—Put on as much dope as you want. "Backbone" construction simplifies building—Cuts weight—Saves time. Engine mounted on "Breakaways"—Protects engine and ship—Quickly removable; Elliptical platform wing—Elliptical section fuselage—Proven most efficient; High lift—Low-drag soaring type wing—Slow-stalling tip—High line of thrust to avoid critical dip and initial loss of altitude when engine stops—Light weight—8 oz. per sq. ft. of wing area.

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1/16x1/16 100, 5c	1/8x3/16 12 for 20c	1/16x3/32 1/4 ft. 7c
1/16x1/8 35 for 5c	1/8x1/2 10 for 20c	3/16, 1/4 ft. 10c
1/16x3/16 18, 5c	5/16x3/16 8 for 20c	1/2 ft. pair 18c
1/16x1/2 15 for 5c	1/2x1/2 6 for 20c	1" dia. pair 15c
3/32x3/32 30, 5c	3/4x1/2 3 for 20c	1 1/2" dia. pair 18c
1/2x1/2 30 for 5c	1/2x3/4 1 for 8c	2" dia. pair 18c
1/2x3/4 12 for 5c	3/4x3/4 2 for 20c	3" dia. pair 1.50
3/4x1/2 10 for 5c	1/2x1 1 for 8c	4" dia. pair 1.50
3/4x3/4 8, 5c	1x1/2 1 for 8c	5" dia. pair 1.50
1x1/2 6 for 5c	1x1 1 for 8c	6" dia. pair 1.50
1x3/4 2 for 5c	1x1/2 1 for 8c	8" dia. pair 1.50
1x1 4 for 10c	1x1 1 for 8c	10" dia. pair 1.50
1x3/2 8 for 10c	1x1 1 for 8c	12" dia. pair 1.50
1x2 8 for 10c	1x1 1 for 8c	14" dia. pair 1.50
1x3/2 7 for 10c	1x1 1 for 8c	16" dia. pair 1.50
1x2 6 for 10c	1x1 1 for 8c	18" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	20" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	22" dia. pair 1.50
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1x3/2 3 for 10c	1x1 1 for 8c	28" dia. pair 1.50
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1x2 3 for 10c	1x1 1 for 8c	34" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	36" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	38" dia. pair 1.50
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1x2 3 for 10c	1x1 1 for 8c	50" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	52" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	54" dia. pair 1.50
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1x2 3 for 10c	1x1 1 for 8c	74" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	76" dia. pair 1.50
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1x3/2 3 for 10c	1x1 1 for 8c	80" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	82" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	84" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	86" dia. pair 1.50
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1x2 3 for 10c	1x1 1 for 8c	98" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	100" dia. pair 1.50

CELLULOID

1/16x1/16 100, 5c	1/8x3/16 12 for 20c	1/16x3/32 1/4 ft. 7c
1/16x1/8 35 for 5c	1/8x1/2 10 for 20c	3/16, 1/4 ft. 10c
1/16x3/16 18, 5c	5/16x3/16 8 for 20c	1/2 ft. pair 18c
1/16x1/2 15 for 5c	1/2x1/2 6 for 20c	1" dia. pair 15c
3/32x3/32 30, 5c	3/4x1/2 3 for 20c	1 1/2" dia. pair 18c
1/2x1/2 30 for 5c	1/2x3/4 1 for 8c	2" dia. pair 18c
1/2x3/4 12 for 5c	3/4x3/4 2 for 20c	3" dia. pair 1.50
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1x2 3 for 10c	1x1 1 for 8c	98" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	100" dia. pair 1.50

WIRE

1/16x1/16 100, 5c	1/8x3/16 12 for 20c	1/16x3/32 1/4 ft. 7c
1/16x1/8 35 for 5c	1/8x1/2 10 for 20c	3/16, 1/4 ft. 10c
1/16x3/16 18, 5c	5/16x3/16 8 for 20c	1/2 ft. pair 18c
1/16x1/2 15 for 5c	1/2x1/2 6 for 20c	1" dia. pair 15c
3/32x3/32 30, 5c	3/4x1/2 3 for 20c	1 1/2" dia. pair 18c
1/2x1/2 30 for 5c	1/2x3/4 1 for 8c	2" dia. pair 18c
1/2x3/4 12 for 5c	3/4x3/4 2 for 20c	3" dia. pair 1.50
3/4x1/2 10 for 5c	1/2x1 1 for 8c	4" dia. pair 1.50
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1x3/2 3 for 10c	1x1 1 for 8c	32" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	34" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	36" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	38" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	40" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	42" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	44" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	46" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	48" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	50" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	52" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	54" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	56" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	58" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	60" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	62" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	64" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	66" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	68" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	70" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	72" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	74" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	76" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	78" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	80" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	82" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	84" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	86" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	88" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	90" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	92" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	94" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	96" dia. pair 1.50
1x2 3 for 10c	1x1 1 for 8c	98" dia. pair 1.50
1x3/2 3 for 10c	1x1 1 for 8c	100" dia. pair 1.50

BAMBOO PAPER

1/16x1/16 100, 5c	1/8x3/16 12 for 20c	1/16x3/32 1/4 ft. 7c
1/16x1/8 35 for 5c	1/8x1/2 10 for 20c	3/16, 1/4 ft. 10c
1/16x3/16 18, 5c	5/16x3/16 8 for 20c	1/2 ft. pair 18c
1/16x1/2 15 for 5c	1/2x1/2 6 for 20c	1" dia. pair 15c
3/32x3/32 30, 5c	3/4x1/2 3 for 20c	1 1/2" dia. pair 18c
1/2x1/2 30 for 5c	1/2x3/4 1 for 8c	2" dia. pair 18c
1/2x3/4 12 for 5c	3/4x3/4 2 for 20c	3" dia. pair 1.50
3/4x1/2 10 for 5c	1/2x1 1 for 8c	4" dia. pair 1.50
3/4x3/4 8, 5c	1x1/2 1 for 8c	5" dia. pair 1.50
1x1/2 6 for 5c	1x1 1 for 8c	6" dia. pair 1.50
1x3/4 2 for 5c	1x1 1 for 8c	8" dia. pair 1.50
1x1 4 for 10c	1x1 1 for 8c	10" dia. pair 1.50
1x3/2 8 for 10c	1x1 1 for 8c	12" dia. pair 1.50
1x2 8 for 10c	1x1 1 for 8c	14" dia. pair 1.50
1x3/2 7 for 10c	1x1 1 for 8c	16" dia. pair 1.50
1x2 6 for 10c	1x1 1 for 8c	18" dia. pair 1.

place—Joe Boodley; 19 points for design; 77-1/2 points flying. Total—86-1/2 points.

In the glider event first and second broke the city record. All first and second place winners received gas model kits from the Trenton Hobby Shop, and the high point winner for the meet received a gas model kit from Megows, through their local representative Mr. Hooper.

Allentown

The Lehigh Aeronautical Society has been doing a fine thing in presenting a free Aviation Mechanics Training Course to those students in the Lehigh Valley area who are unable to afford the price of a course of training in regular schools. Those who may have equipment to donate to this worthwhile project should write Mr. W. N. J. Wiand, Director, at 1231 Emmett Street, Allentown, Pa.

Saint Louis

Mr. H. T. Sommers, Director of the Stix, Baer and Fuller Model Airplane Club, St. Louis, Missouri, writes as follows:

"It has been some time since we have released any news regarding our club and general activity in this vicinity, and since so many boys read your magazine in this section, I know they will be interested in hearing about what is going on in St. Louis.

"The S.B. & F. Club has available now, to its membership, a splendid gas model division, and is, at present, in the process of constructing a laboratory ship which they expect to start flying experiments as soon as the weather permits. This particular division of the club elects its own membership, and contrary to the other divisions, operates on a very informal basis, since it is made up of older members who come primarily for the association and fellowship and the open discussion, which, incidentally, has proven to be tremendously successful in bringing out dormant ideas.

"The club is planning a huge membership drive in late March and to the winner of the drive will go a fine shiny bicycle. We plan to have our usual minor contests during the spring and summer, and will hold the national eliminations two weeks before the contest in Detroit to select representatives for St. Louis.

"In the middle of August we will hold our usual Eighth Annual Mississippi Valley Model Builder contest, which is open to any model airplane contestant who likes to take home prizes.

"For a few personalities on parade we give you member Pete Caleca practically finished with a Douglas Sleeper plane, which he intends to install a Brown Jr. motor, and Fred Bichel, who has designed and is now in the progress of constructing a high-climb gas endurance model. The only dope we can get on it so far is that it has a 45 inch elliptical wing, and is powered with a Brown motor. Bob Miller, pioneer gas model builder, is completing a 8-1/2 foot gull-wing ship and threatens to give contestants a run for their money this year.

"Much to our pleasure there has been a considerable, and for unaccountable rea-

HEATHE'S NEW MONARCH

Everything you desire in a high powered gas model. Beautiful lines, easy construction, unexcelled performance. Modern twin rudders and airfoil section and with simplified tapered wing. All wood, finished prop, wheels and tissue. Most 5 ft. 8 in. Wingspan complete kit. \$4.75 Postpaid in U.S.A.

HEATHE APPROVED MOTORS

All motors carry double factory guarantee against defects in material and workmanship for 60 days. All motors and replacement parts in stock at all times.



The new unconditionally guaranteed motor, complete, ready to run with coil and condenser.

The New Sensational Brown Jr. Motor

Model "D" \$12.50 Model "M" \$15.00

Model "B" \$21.50 Model "C" \$25.00

Model "23" \$21.50 Model "23" \$25.00

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OTHER HEATHE TESTED GAS KITS

HEATHE WASP 3 1/4" super-high climb baby gas job. \$3.75
AIR CHIEF 5" record breaker at all contests. \$6.00
CLIPPER 3 1/4" GOLDBERG designed high climb record breaker. \$4.95

ALL KITS CONTAIN: Full size plans and printed sheets, cement, dope, hardware and ignition equipment. ALL KITS GUARANTEED PERFECT. ALL KITS SENT POSTFREE.

FREE—

With each Monarch Kit or \$4.00 order, we will include absolutely FREE 1 GAS PROP (your specification) and 1 can SAE 70 VALVE-o-LINE Motor Oil.

ALSO You get Valuable Premium coupons with everything you buy.

APPROVED GAS MODEL SUPPLIES

Wood can be had in Spruce, Bass or Balsam at the same price as those listed below.

BALSA

5 ft. lengths

1/4x1/4...4 for .10

1/4x1/2...3 for .14

1/4x1...2 for .15

3/16x3/16...3 for .25

3/16x1/2...2 for .10

3/16x1/4...6 for .25

1/4x1...4 for .25

1/4x1/2...3 for .25

3/16x3/16...3 for .25

3/16x1/2...2 for .25

1/4x1...1 for .18

1/4x1/2...1 for .25

3/16x3/16...1 for .25

3/16x1/2...1 for .25

1/4x1...1 for .25

1/4x1/2...1 for .25

3/16x3/16...1 for .25

3/16x1/2...1 for .25

1/4x1...1 for .25

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3/16x3/16...1 for .25

3/16x1/2...1 for .25

1/4x1...1 for .25

1/4x1/2...1 for .25

3/16x3/16...1 for .25

3/16x1/2...1 for .25

APPROVED RUBBER MODEL SUPPLIES

3" sheets or 30" lengths, double above prices; add 10c for package charge for 30" lengths.

1 1/2" Balsa

1/16x1/16...100-5c

1/16x1/8...35-5c

1/16x1/4...18-5c

3/32x3/32...18-5c

1/4x1/4...30-5c

1/4x1/2...30-5c

1/2x1/2...8-5c

1/2x1/4...6-5c

1/2x1/8...6-5c

1/2x1/16...6-5c

1/2x1/32...6-5c

1/2x1/64...6-5c

1/2x1/128...6-5c

1/2x1/256...6-5c

1/2x1/512...6-5c

1/2x1/1024...6-5c

1/2x1/2048...6-5c

1/2x1/4096...6-5c

1/2x1/8192...6-5c

1/2x1/16384...6-5c

1/2x1/32768...6-5c

1/2x1/65536...6-5c

1/2x1/131072...6-5c

1/2x1/262144...6-5c

1/2x1/524288...6-5c

1/2x1/1048576...6-5c

1/2x1/2097152...6-5c

1/2x1/4194304...6-5c

1/2x1/8388608...6-5c

1/2x1/16777216...6-5c

1/2x1/33554432...6-5c

1/2x1/67108864...6-5c

1/2x1/134217728...6-5c

1/2x1/268435456...6-5c

1/2x1/536870912...6-5c

1/2x1/1073741824...6-5c

1/2x1/2147483648...6-5c

1/2x1/4294967296...6-5c

1/2x1/8589934592...6-5c

1/2x1/17179869184...6-5c

1/2x1/34359738368...6-5c

1/2x1/68719476736...6-5c

1/2x1/137438953472...6-5c

1/2x1/274877906944...6-5c

1/2x1/549755813888...6-5c

1/2x1/1099511627776...6-5c

1/2x1/2199023255552...6-5c

1/2x1/4398046511104...6-5c

1/2x1/8796093022208...6-5c

1/2x1/17592186044416...6-5c

1/2x1/35184372088832...6-5c

1/2x1/70368744177664...6-5c

1/2x1/140737488355328...6-5c

1/2x1/281474976710656...6-5c

1/2x1/562949953421312...6-5c

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MODEL AIRPLANE CO.
260-B5 TROY AVE.
BROOKLYN, N. Y.

300 PINS and RINGS SHOWN IN BASTIAN'S FREE 1939 CATALOG

BIGGEST SELECTION, low prices, traditional Bastian quality—the combination that has kept Bastian out front 44 years. Pins in 2 colors with any 3 or 4 letters and year. Handmade Sterling silver rings. Check out with confidence. Bastian Pins and Rings everywhere. Glides, largest makers. Write for the new catalog today!

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MERCURY MODEL CO. MOTOR Repair Kit!

IT HAD TO COME! A repair kit with full materials and tools to repair any "junk" or at a costly loss "trade-in" your pet motor—just because of something that went wrong. NOW, you can easily, quickly and perfectly repair it, get extra added hours of champion performance! With every Repair Kit you get a FREE "trouble-shooting" Manual. This helps you to easily locate the trouble and how to go about repairing it. The materials and tools are enough and over, and of everything you may need to repair ANY TROUBLE OR BREAKDOWN OF ANY MODEL MOTOR. Don't wait—order your MERCURY MODEL REPAIR KIT Now, in time for the championship competitions to come—and for many added long hours of exciting thrilling fun!

FREE BOOKLET
With every Kit, we give you absolutely FREE a copy of "HELPFUL HINTS TO THE ENGINE REPAIR MAN." Will positively help you to locate and correct any engine trouble. Complete with many illustrations and diagrams.

CONTENTS OF KIT:
*Electric Soldering Iron, AC-DC, 5-Acid Core Solder. *Big Vise, can hold any size motor. *Very fine Ignition File. *Two open end Wrenches, and specially designed Alligator Wrench, to fit any size nut to 1/2 inch. *Strong, Catalin, magnetized, shock-proof Screw-driver. *Large roll water and oil proof Hook-up Wire. *Fibre Gasket Material. *Bottle of Gasket Sealac. *Bolt of Friction Tape. *Dozens of different size Nuts, Bolts and Screws for motor mounts, etc. *Open and closed Clips for Battery and other connections. *Classy, water-proof Motor Cover. *Packed in beautiful 2 piece Storage Box.

STANDARD KIT
\$2.50
plus 25c postage

DeLuxe Kit \$3.00
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DEALERS and JOBBERS: Write for special discounts!

MERCURY MODEL CO., 1592 Lincoln Place, Dept. M-5, Brooklyn, N. Y.

planes per month, 100 commercial models. Factory covers 23 acres with 1,315,974 square feet of floor space, making it the largest aircraft factory in the entire world! Sales totalled twenty-eight millions in 1938. Employs 550 men and pays one million dollars per month in payrolls. Latest is the DC-5 which exceeded expectations on its first test flight February 18th. American Airlines has ordered seven for New York World's Fair transportation. K.L.M., Trans-European-Asiatic Airline, has ordered four DC-5's and six DC-4's, the latter to be powered with P&W Twin Hornets, and delivered in 1940.

From France come orders for 515 American planes at a cost of sixty million dollars: 100 Curtiss P-36C-1 (in addition to the 100 already delivered); 200 North American NA-16 types; 115 Martin twin-engine light-bombers and 100 Douglas Mystery Attack-bombers. Motors: 430 P&W Twin Wasp Seniors and 200 Wright Cyclones. The second 100 Curtiss pursuits will be manufactured in the St. Louis Airplane Division, home of the CW-21 Interceptor. That this order is for this latter type ship appears a likelihood in the light of this news. The CW-21 is the fastest climbing military plane in the world!

Captain Paul Chemidlin, victim of the Douglas Mystery Bomber crash, which had world-wide repercussions, has been made an officer of the Legion of Honor by the French Air Ministry. He has fully recovered from his injuries.

The Douglas French order, as approved by the President and his experts, states that these ships must not leave French soil!

North American Aviation is scheduling 15 low-wing basic trainers per week on its orders for 200 to England and a like number to France. Total back-log: twenty-five millions plus. Their new twin-engine export bomber is tricycle!

Los Angeles' irritating airport problem may soon be solved with the projected three million dollar improvement program for the Municipal Airport in Inglewood. Home of Douglas' El Segundo Division (nee Northrop), North American Aviation, Inter-state Aircraft and California Flyers, these tenants will make room for five major airlines upon completion of the work. A recently developed fog-fighting tower will rid the airport of its inherent menace.

Lockheed continues to make news with projected expansion and re-financing. Latest orders are: 50 additional R.A.F. "Hud-

sons," 34 Model 14's, 16 Model 10's, and 9 Model 12's. Latest designs are the Model 16 (Aero-twin), the Model 22 (Air Corps' sensational pursuit), the Model 24 (28-passenger transport) and the mysterious Model 44! The British Bombers are equipped with tricky collapsible lifeboats mounted along the cabin interior. No land-going bombers, these! Lockheed is buying back eight Model 14 transports from Northwest Airlines as a result of recent mid-winter crashes. First time such action has taken place in big-time aviation history. They will be re-conditioned and offered for resale to private customers. Watch for a Lockheed-Ryan merger in the very near future. Ryan is now doing 50% parts-work on Lockheed ships and financial interests are closely related with inner-buying continued.

More news of Inez Gibson's Bendix Trans-continental Douglas A-17A charger: P&W Twin Wasp Senior powered, cruising speed of 278 miles per hour, 590 gallons of gas, non-stop range of 2700 miles (touch-and-go distance from Burbank to Bendix). Jacqueline Cochrane Odum will defend her 1938 Championship in her Seversky with slight modifications. Watch her for a record before the September classic.



DeLuxe & Standard

MOTOR VALUE—DOLLAR VALUE

1939 "O.K." MODELS

AN EASY STARTER A CONSISTENT PERFORMER

Let us examine values—Our Special Model "O.K." aircraft motor incorporates such features as one piece cylinder ground and lapped, hardened piston, hardened piston pin, connecting rod drop forged from steel and hardened, hardened crankshaft, one piece instantly removable gas tank held in place by spring loaded ball snap locks, a needle valve permitting fine adjustment, an air control slide, shake proof friction spring for needle valve and air control slide, a rugged and highly efficient ignition system which will operate for many hours without adjustment.

Do you know of any motor on the market having all the aforementioned engineering refinements that sells for less than \$21.00 to \$25.00, yet our Special motor sells for only \$11.80. Truly the outstanding motor and dollar value of today.

Specifications	Prices
Bore, .900"; stroke, 31/32"; R.P.M., 10,000;	Special, \$11.80
H.P., 1/5 plus; Weight, bare, 7 3/4 oz.;	Standard, 17.80
Height, incl. plug, 4 11/16"; Displacement,	DeLuxe, 21.00
.616-10 c.c. Factory tested and guaranteed.	Marine-D., 22.50
	Marine-S., 13.30
	Inverted, ext. 1.50

All motors complete with coil, condenser, etc., ready to run.



Special Model \$11.80

ORDER THROUGH YOUR DEALER, IF NOT CARRIED BY YOUR DEALER ORDER DIRECT FROM

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THE PERFECT COMBINATION AT THE PERFECT PRICE

FLASH—Miss Tiny wins 1st, 2nd and 3rd at Pomona, Calif., against entire field of over 300 models.



MISS TINY

One of the fastest selling kits in America and a proven winner with a record of 24 1/2 minutes on a 45 second engine run. 46" span. Kit contains spun cowl, silk, 2 1/2" air wheels, cement, dope, die-cut ribs, plenty of good balsa and full size plans. (Regular price \$3.95.)

Atwood PHANTOM

Get the extra, plus power that only Phantom can give you. Bill Atwood's record breaking 5/8 Phantom is the biggest, most powerful engine in its class, displacing a full 27 cu. in. under the new N. A. A. rules for engines up to 30 cu. in. displacement. (Regular price \$9.75.)

Get this perfect combination today at the special price. For action... Send the coupon NOW!

SPECIFICATIONS: Downmetal crank case; 1/7th H.P. at 6500 r.p.m. (develops nearly 1/6 H.P.); runs upright or inverted; bare weight 3 1/2 ounces; flying weight with 2 pen light cells 7 1/2 ounces; hardened steel timing cam; new quick starting carburetor; oversize bronze bearings.

both for only \$

12.50
WITH
PROP

Phantom Motors, 800 East Gage Avenue, Los Angeles, California.

Please rush prepaid the items checked below. Money Order enclosed.

- ☐ Miss Tiny kit, Phantom Engine and varnished hardwood propeller, as advertised . . . \$12.50
☐ Miss Tiny Kit . . . \$3.95 ☐ Atwood Phantom Engine \$9.75 ☐ Hardwood Propeller . . . 49c
 Add 3% for Sales Tax if delivery point is in California.

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ADDRESS _____



SPORTCRAFT KAYAKS

Easy to build—Fast—Seaworthy
 —Light—Designed by Expert
 Canoeists for Speed, Safety and
 Durability at Low Cost. Complete

Construction Kits contain all wood parts cut to size and ready to fit, plywood ribs, canvas, airplane dope, spar varnish, etc. Paddle included free if you rush order.
 1 Man Model—PCC1, (Illustrated above) Length 10 ft. Weight 30 pounds. Complete Kit—Price only \$10.00
 Ready Built—Price only \$25.00
 2 Man Model—PCC2, Length 13 1/2 ft. Weight 35 pounds. Deluxe Kit—Price only \$17.95
 Ready Built—Price only \$35.00

All Kits Shipped by American Railway Express
 Send \$5 for our New Illustrated Folder
SPORTCRAFT KAYAKS
 105 Pearl St. Paterson, New Jersey

THE FLOYD MIRRO-FILM

A completely finished covering individualized for your type of model. Supplied in four types, "A" for the large gas models, "B" for medium size, "C" for midsize gas jobs, and "D" for rubber powered models. Even type "A" is lighter than conventional coverings while "D" is approximately 1/2 the weight of "A".

You will find the **FLOYD MIRRO-FILM** several times stronger than your usual covering with a finish superior to that obtainable by any other method applicable to models. This covering is now obtainable in sheets 24" x 36" in red, orange, yellow, white and black, at the price of 65c per sheet P.P. This low price brings this amazing covering to only 20c per thousand sq. in. above the cost of ordinary covering.

We submit **MIRRO-FILM** as being completely resistant to oil, gas, water, dope, and glue. Excess glue drops or smears can be removed from its surface with nitrate dope thinner. This flexible covering tightens itself over night after application to your model.

FLOYD BROS. MODEL SUPPLIES
 1388 Carr Avenue, Memphis, Tenn.

First of 27 Curtiss P-36C-1's to arrive at Villacoublay Field, Chalais-Meudon, France (French Air Force's Wright Field) were sabotaged! Heavy sediment deposits were found in gas tanks. Leftist antagonists were suspected by strong field guard.

Major Caleb Haynes received Distinguished Flying Cross for command of Brobdingnagian Boeing XB-15 on 4933-mile mercy flight from Panama to Santiago, Chile. Three hundred pounds of serum and 3250 pounds of medicinal supplies were rushed to earthquake-ridden nation in 29 hours, 53 minutes. Lighter return trip took only 19 hours (260 miles per hour!).

More claimants for World's Fastest Human title: Lieutenant Troy Keith dived 670 miles per hour while unconscious after oxygen failure over Barksdale Field, Louisiana. Undisclosed Brewster XF2A-1 flyer (an official U. S. Navy Test Pilot) claims his full power dives surpassed 700 miles per hour 18 months ago over Brewster's Long Island factory! (Speed of sound: approximately 750 miles per hour!)

According to most authenticated reports: Germany has 10,000 planes and 230,000 men in her air force; Italy has 4400 planes and 435,000 men in her air force, more men than we have in our standing army!

All Northwest Airlines planes will be equipped immediately with the new Mayo Mask oxygen breathers which permit conversation and relative freedom to the wearer. Cruising altitude will be upped to 20,000 feet with accompanying average temperature of 32 degrees below zero! Northwest Airlines flies the toughest sched-

ule in America with paradoxical best flight record.

Fighting ship cost (Curtiss-Wright XP-40): One ship, \$224,125.00; two thousand ships, \$24,460.00 each!

First of 39 Boeing B-17B's arrived recently at Wright Field. Modifications include blowers (superchargers) and numerous refinements in structure and accommodations.

Lincoln Ellsworth, upon reaching civilization at Hobart, Tasmania, claimed 430,000 square miles of Antarctic territory for America. He will return to the far-South region in January, 1941, and live there all winter with two companions.

Curtiss-Wright's latest is the Wright "Twin Cyclone" of better than two thousand horsepower now undergoing tests, and will be fitted to that company's twin-engined strato-liner Model CW-20.

Eccentric Lester P. Barlow was awarded \$592,719.21 for five patent claims on air bombs used by the Army Air Corps in a recent Congressional enactment.

Juan de la Cierva, autogiro father, has been immortalized with the inscription of his name on the facade of the Daniel Guggenheim School of Aeronautics, New York University, and \$15,000 in fellowships has been founded in his honor.

Howard Hughes, who flew 14,874 miles in 91 hours, 17 minutes, and Squadron Leader R. Kellett, who led a flight of three Royal Air Force Bombers on the 7,138.5 miles flight from Ismailia to Port Darwin, were deemed of equal value to aviation in 1938 and no Federation Aeronautique International Gold Medal was awarded. However, Prince Bibesco, President of the F.A.I., honored the two flyers with special medals commemorating their outstanding achievements.

England's latest two-seat fighters (British equivalent of our attack plane) are the Boulton & Paul "Defiant" and the Hawker "Hotspur." Both ships are near-identical in tapered-nose, retractable landing gear, low-wing, spherical power-driven multi-gun turret outlines. For Royal Air Force competition in March. Both are capable of 300 miles per hour; both use Merlin engines of 1145 horsepower at 16,750 feet.

Pan American Airways' Trans-Atlantic subsidy from the United States Treasury and Post Office Departments amounts to \$996,000 for the service.

The United States leads the world in technical aerodynamic research equipment under direction of the N.A.C.A., Langley Field, Va.

Radioman M. M. Voznesensky has been sentenced to 20 years imprisonment for sabotaging radio communications from Sigismund Levaneffsky on the latter's ill-fated long-distance flight from Moscow to the United States in 1937. With five crewmen, the famed airman was lost over the North Pole and became the object of an extensive search. Responsibility for the catastrophe has thus been placed.

Consolidated Aircraft has offered all drawings, designs, jigs, tools and dies for the PBV-4, twin-engine long-range patrol boat, to the British Government. Alternatively, they have offered their present factory output of these ships.

Among the most popular exhibits at the San Francisco Golden Gate Exposition is

a sleek Boeing B-17A "Flying Fortress," the latest of its type.

The General Headquarters Air Force has been merged with the regular Army Air Corps with Major-General Henry H. Arnold as Commander. All tactical problems relative to the GHQ Air Force's formation have been solved and impending air corps expansion makes this single command a necessity.

The Northill Company, exclusive distributors for the English Covic Diesel engine (John K. Northrop, President), has increased its order to the Covic Diesel Division of the Menasco Manufacturing Company from 1000 to 1500. Production at the Los Angeles Menasco plant has been upped to 100 engines per month. One hundred have already been delivered.

The Goodyear-Zeppelin Corporation of Akron, Ohio, will build the navy's new 1,080,000 cubic foot capacity, 325 feet long dirigible at a cost of \$1,997,482.00. It will be completed in March, 1941. A three million cubic foot dirigible of the "Akron-Macon" class is under consideration at a cost of \$2,940,350.00. Goodyear-Zeppelin was the lone bidder, the Detroit Aircraft Corporation deciding not to enter a proposal.

The United Aircraft Corporation, builders of the Vought SB2U-2 low-wing scout-bomber, has extended to China fifteen million dollars in credit towards the purchase of warplanes.

Transport record: Al Litzenger, in a standard Lockheed 14-H, averaged better than 260 miles per hour in an 8 hour, 28 minute flight from Los Angeles to Pittsburgh.

Two hundred Bellanca model 28-90B low-wing fighter-bombers for China at a cost of \$8,300,000.00.

Switzerland has ordered 900 Curtiss-Wright Bomber-fighters.

OUR HIGH REVS AND CLOGGED CARBURETORS DEPARTMENT

High revs to *Aviation's* able editor, S. Paul Johnson, and his lucid report on the state of Europe's air strength, particularly Germany. He is an extremely shrewd observer and an eminent figure in aviation circles everywhere. States he: "Germany probably has more than ten thousand fighting planes available, and by 1940 will be producing eight thousand military ships annually." German aircraft factories are models of compactness, safety and efficiency, he further comments, and are cleverly located from a strategic military point of view.

Clogged carburetors to those vociferous pseudo-patriotic pacifists in Washington in their condemnation of President Roosevelt and his policy towards France and her interest in our fighting planes. Their publicity-seeking orations, their pointless, unsubstantiated arguments and their accusations have struck a veritable deathblow to our Army Air Corps for, as a result of their thoughtless actions two of the world's deadliest fighting planes, the Douglas Mystery Attack-Bomber and the Curtiss-Wright CW-21 Interceptor, have been lost to our national defense forces. Had they been aware that in loudly crying for adequate defense they were driving it from us they might have foreseen the inevitable result of their lack of sheer brainwork. France,

Satisfaction guaranteed; each kit contains enough material to complete the model or Double your money back!

Still AMERICA'S MOST MODERN GAS MODEL the LANCER

Are you tired of building one type of gas job all the time? You are it to yourself to see the new LANCER. It is the only model that combines sleek lines and thrill packed performance. Have a real winner this season, build the Lancer. Included in the kit are cut out ribs and formers, full size plans, ALUMINUM COWLING, wire, cement, dope and all strip and sheet balsa needed (minus wheels). **\$4.95** pp. With streamlined air wheels, colored dopes and a finished prop. Plans 50c. **\$5.95** pp. THE 45" LANCER for small bore motors has the greatest strength, weight ratio of any small gas job. Assembly time is cut in half with this pre-fabricated kit including cut out ribs, formers, sides, etc. **\$1.95pp.** (minus wheels).



With air wheels, colored dopes and a finished prop...\$3.50 pp.

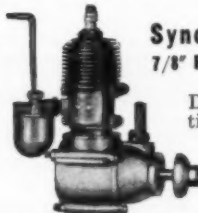
The THUNDER BIRD "45"

This is the small job that literally flew the wings off over 60 large models recently to establish an endurance record that hasn't been equalled by any model in competition yet. Cut out ribs and formers, steel wire, balsa sheets and strips, cement, dope, etc. (no wheels) are included in the kit for only **\$1.95** pp. With air wheels, colored dopes and a finished prop...\$3.50 pp. THE 6" THUNDER BIRD has flown for 17 min. on a 30 sec. engine run and amazed experts by winning a recent meet carrying a 1 1/2 lb. load. Complete with cut out ribs and formers, full-size plans, cement, dope, etc. (no wheels). **\$3.95pp.** With streamlined air wheels, colored dopes and a finished prop. **\$5.95pp.** Plans 25c.

Synco ACE SPECIAL MOTOR

7/8" Bore 15/16" Stroke Approx. 1/5 H. P. Up to 8000 R. P. M.

Doubly guaranteed against defective workmanship and materials for 60 days. Complete with coil, condenser, oil and 14" prop **\$9.95** pp. or \$7.50 and your old motor.



Free catalog on request

NEW CYCLONE AIRCRAFT CO.

(Dept. A9)
166 Richards St.
Brooklyn, N. Y.

V. K. PRESENTS THE MASTER!



THE MASTER has a 6 ft. wingspread and weighs 3 1/2 lbs., complete, ready to fly. THE MASTER is ultra-modern, having an elliptical wing, a high rate of climb wing section, and is streamlined in every detail. The performance is sensational, climbing approx. 800 ft. per min., and soaring on the slightest thermal. Any 1/4 or 1/2 H.P. motor may be used and mounted either upright or inverted as shown.

The complete kit includes a full size easy to read drawing; all strip wood cut to correct size; curved parts, such as bulkheads, etc., clearly printed on sheet balsa; large quantities of cement, clear and colored dope; balloon type wheels; ignition equipment; semi-finished prop, etc. Nothing else to buy except power plant, only **\$5.85** P.P. Kit with 3 1/2" dia. inflatable airwheels **\$6.95**

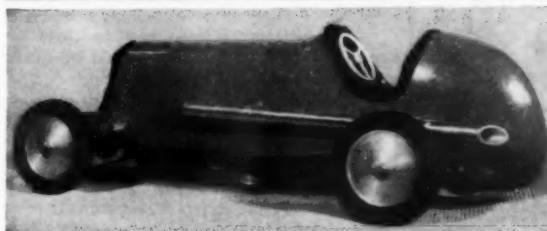
See these kits at your dealer's. If he can't supply you, order direct.

THE CHALLENGER

THE CHALLENGER has a 68" wingspread, weighs 3 lbs., complete, and uses any 1/4 or 1/2 H.P. motor. CHALLENGERS have won numerous contests, and many have been bought by model builders in foreign countries. The complete kit includes full size detailed drawing, ignition equipment, many finished and semi-finished parts, all necessary liquids, **\$4.85** P.P. Nothing else to buy except power plant, only **\$4.85** P.P. Complete kit with 3 1/2" rubber tired wheels only \$5.85. Send stamp for our free illustrated leaflet on kits, engines, etc.

V. K. MODEL AIRPLANES & SUPPLIES

(Model airplane engineers since 1927)
7304 Main Street Williamsville, N. Y.



FRONT WHEEL GEAR DRIVE—UP TO 60 PER HOUR.

Here's what your Track-Master kit contains:

1. Full size plans.
2. Machined Alum. wheels, bronzed bushed.
3. Front spring castings, drilled and bushed.
4. One set of Boston Bevel Gears.
5. Cast Aluminum Radiator.
6. Metal Die Cast steering wheel.
7. Steel Axles.
8. Drilled motor Mount.
9. Semi-finished soft-pine body.
10. Ready built rear axle assembly.
11. Steel tie rods and spreader.
12. Sheet Aluminum hood.
13. One pair body frames (Drilled).
14. Set of Seiberling Tires.
15. 12" Aluminum exhaust pipe.
16. Nuts, bolts, screws and washers.

COMPLETE KIT with Boston Bevel Gears (less motor and fly wheel)

\$8.50

THIS MONTH ONLY
Postage 50 cents
IMMEDIATE DELIVERY
Stay in the lead with a TRACK-MASTER

A MASTERPIECE IN RACING CARS

Engineered for Speed and Durability

THE TRACK-MASTER

is the latest and best equipped racing car on the market. Built of best materials obtainable. Precision parts. For any 1/4 to 1/2 H.P. motor. Quick assembly.

SPECIFICATIONS:

13" wheel base
8" tread
Length over-all 19 1/2"
Gear ratio 2 to 1.

Special Hi-speed fly wheel. Designed for Track-Master. \$1.25 P.P.

NOTICE—The Standard Retail Market Price of Track-Master is **\$14.85** Positively no reduction after May 5, 1939. FULL SIZE PLANS \$1.00

AIRCRAFT MANUFACTURING COMPANY

152 West 42nd Street

New York City

EASY TO ASSEMBLE—EASY TO OPERATE—HIGHEST VALUE—\$5.00No oil,
Gas, Bat-
teries
or Pro-
peller
included**ONE DAY
DELIVERY****REAL ENGINE VALUE**

Over 7000 of these same famous G.H.Q. gasoline engines were sold at \$8.50. Mass production methods and enthusiastic reception have enabled us to reduce the price from \$35 originally to the **NEW LOW PRICE** of \$5 for a vastly improved kit.

\$5.00

THE G.H.Q. GAS ENGINE KIT IS ABSOLUTELY COMPLETE!! ALL MACHINING DONE—ALL YOU NEED IS A SCREWDRIVER!!

G. H. Q. KIT OFFERS MANY SPECIAL FEATURES

1939 Model now available includes:

1. New High Compression centerless ground Piston and Cylinder honed to .0001 inch on our new \$2500.00 Hutto Double Honer.
2. CHAMPION spark plug
3. WINSTON spark coil
4. New light carburetor with spring control
5. Free Sportster Gas Model Plans
6. New illustrated & detailed assembly instructions. No mechanical knowledge necessary.

Exactly the same parts that go into our \$10 assembled Engine

WHY OUR PRICE IS LOW:

1938 Sales of G. H. Q. Engine Kits were in excess of 10,000

1939 Sales at 12,500 Rate**AN ENGINEERING TRIUMPH AT A RECORD LOW PRICE**

Indeed an engineering triumph based on years of exhaustive scientific aerodynamic research. The G.H.Q. motor has broken records for amazing performance . . . flies model planes from 4 to 10 foot wingspread . . . just as efficient for boats, midjet cars, etc. Easy to start and simple as ABC to operate. All parts absolutely finished and guaranteed. 1/5 H.P.

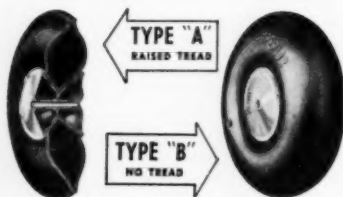
HOW TO ORDER: WE SHIP EXPRESS COLLECT C.O.D. FOR BALANCE

SEND ONLY \$1.00

ILLUSTRATED 12-PAGE MOTOR, PLANE AND HOBBY CATALOG 3c

DEALERS

Share in the demand for G.H.Q. products. Write for discount schedule and sales helps.

G.H.Q. MOTORS INC.**854M East 149 Street****NEW YORK, N.Y.****MARPELL**
STREAMLINES IN 2 TYPES

Get the **finest** gas model wheel money can buy. You pay only a trifle more, yet Marpells overcome the defects of wheels made by rubber toy methods. Now a choice of two types in 3 1/2" and 4 1/2" diameters. Type A, with raised tread prevents ground looping, permits safe landings in wind. Type B, with no tread for those who prefer newest, realistic streamline appearance.

Patented Marpell hub of 2450 dural is heat treated and highly polished with bronze bearing for 1/4" axle. "Air check" inflation valve will not leak. Inflator furnished.

Order direct from this ad or see your local dealer. Be one of the hundreds who have found Marpells flawless in design and material.

Tail Wheel Included
A Marpell streamlined live rubber tail wheel with molded in bronze bearing will be included with each pair of wheels.

Specify Type A or B; 3 1/2" or 4 1/2" diameter. California buyers add 6c sales tax. For Air delivery add 36c.

\$2.50

Desires write for information.

MARPELL SUPERIOR PRODUCTS CO.
6406 Victoria Ave. Los Angeles, Calif.

NEW BOAT READY!

BUILD OK-4 at Home in a Few Evenings!

Just out!—Mead's sensational 14 foot portable Outboard KI-YAK! OK-4 carries 4 adults and duff—takes motors up to 9 H.P., and mail weighs only 75 lbs. Sea-worthy. Leakproof. Biggest, lightest, strongest of its kind! You can build yours easily, quickly, perfectly at home in a few evenings from our patented, complete construction kit and save nearly **HALF!** Big money assembling, selling to others. (3 other paddle-sail KI-YAKS from 18 to 45 lbs. . . also OK-2 for motor, sail, cars . . . weighs 50 lbs.) Rush dime for illustrated color circulars, amazing low introductory Factory Prices and Special GIFT OARS offer!

MEAD GLIDERS, 15 So. Market, Dept. K-59, CHICAGO

quickly and wisely, stole a march on our Congress by placing huge orders for these two ships, thus making it impossible for our own U. S. Army Air Corps to procure them for two reasons: antiquated Army regulations (which preclude the acceptance of military ships which have been delivered to foreign governments) and manufacturers' production schedules (which make it impossible to deliver additional planes of this type for three years or more). (Author's note: To nip a question in the bud, the Vultee Y1A-19 is an entirely redesigned model of the type delivered throughout the world.) May these political-climbers some day learn that their all-important personalities are indelicately subordinate to the impregnable defense of the people of these United States.

—AMERICA FIRST IN THE AIR—**N.A.A. News***(Continued from page 26)*

through the club itself, which may secure its material locally or write to N.A.A. headquarters for details regarding what we have to offer in the way of uniforms, etc.

An important point to be noted by club leaders is that application should be made for the *Affiliation Agreement*, which should be carefully gone over in the club meeting before affiliation fee is sent in to N.A.A. headquarters. A few groups have sent in their affiliation fees before receiving the agreement form, which gives further particulars. So club leaders, remember; if your organization is interested in becoming affiliated with the Model Division of the N.A.A., write in for your copy of the *Affiliation Agreement* before sending us your fee.

It is suggested that in studying the *Affiliation Agreement*, the N.A.A. columns of the February and March issues of *MODEL AIRPLANE NEWS* be used as references for answering any questions which may arise.

Havana Modelers Active

Ralph Hopkins, brother of N.A.A. Contest Director Carl Hopkins, spent part of a

recent trip south in Havana, Cuba, where he garnered some very interesting facts about the model aircraft enthusiasts down there.

This city has a group of about 20 active gas modelers who, says Ralph, are some of the most active chaps he has seen in a long time. He was most cordially received, and in spite of his lack of knowledge of the language, got along splendidly while an interpreter was hunted, thereby enabling him to ask more definite questions regarding their work. Truly, model aircraft is a universal language.

With the aid of his interpreter, Mr. Hopkins learned that the boys are most intensely interested in gas model building and flying, and expressed an urgent desire to cooperate with the model builders of our states in the exchange of new ideas, etc. He learned that they are planning an air tunnel for their models, based upon the most recent developments in this field, whereby they hope to eliminate any unwanted flight characteristics before actually sending a ship up "on its own."

Another line of activity not usually found in the average club was that of building for themselves a full-scale airplane, in which they plan to install an airplane motor donated to them by a local aviator who is interested in their work.

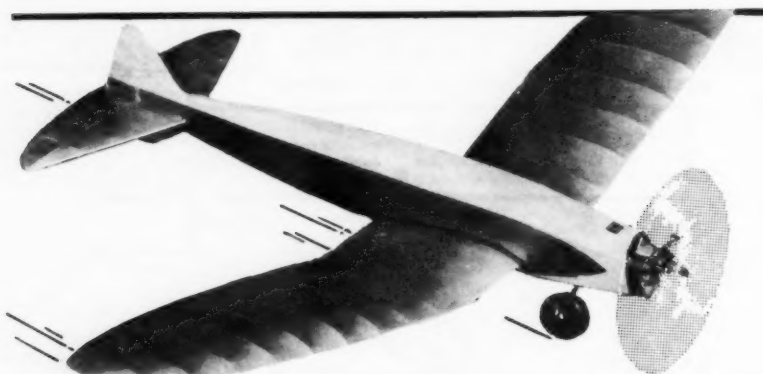
Their official spokesman, J. Prats, would be very glad to hear from any model clubs on the gulf or lower Atlantic seaboard regarding model activity being carried on in the States, and it is probable that they would want to come up and participate in a meet or two. From what we hear, however, any group inviting them to a contest had better have its motors well warmed up, for they are flyers of merit, and will give the other contestants a run for their money.

If you or your club are interested in getting in touch with them, write to J. Prats, Street Consulado, 167 Altos, Havana, Cuba.

Local Boy Makes Good

William Lloyd Barclay, N.A.A. Gas Model Member of Arlington, Virginia, has

383 Seventh Ave., Dept. M, Brooklyn, N. Y.

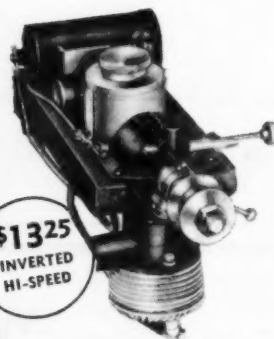


HI-SPEED POWERED STARLINER BREAKS RECORD

Proving itself to be the outstanding low-wing kit, the sensational new Starliner model with an inverted Hi-Speed engine captured *first place* in the low-wing event and placed sixth against nearly 400 other models in the 20-second motor run event, flying 2 minutes 33 seconds at the big meet March 31st at Pomona California.

This is the same sensational model that has been built from coast to coast in competition for the \$50.00 Starliner prize contest on April 8th.

Get this kit today that has already proved itself a champion. 54" span and 445 sq. in. wing area, meets all N.A.A. racing rules. It has **SPEED—FAST CLIMB**—and a S-L-O-W flat glide. Complete kit (less motor) includes 2 1/2" air wheel, silk, dope, cement, full size plans and instructions, and plenty of good balsa wood. Everything is furnished—nothing else to buy—\$4.45 at your dealer's.



**\$1325
INVERTED
HI-SPEED**

**HI-SPEED DIVISION
800 East Gage Ave.
Los Angeles, Calif.**

**TO THE WINNER OF THE NATIONALS WHO
FLIES A HIGH-SPEED POWERED STARLINER**

\$100 CASH

The 1939 Ranger

at
**NEW
REDUCED
PRICES**



**VISIT
our
Chicago
showroom
and see
the many
fine new
models.**

FREE!

Great new
Color Catalog
sent FREE,
Hurry!

prices, special offers. **SAVE 1/2** buying
direct from MEAD!

Tires—Save on lamps, wheels, tires,
equipment. Drop us a postal.

Mead CYCLE COMPANY
Dept. G-171, Chicago

Get your
Ranger now,
while these
special prices
last. All the
latest im-
provements,
among many
styles shown
in 1939 cata-
log. You can have 2-
speed gear-shift, front-
wheel brakes, spring
forks—and genuine Mead
quality besides!

NOW you can ride a gen-
uine Mead bicycle 30
days without "buying for
keeps." Return it at our
expense if not satisfied.
Write quick for FREE
Catalog, marvelous new

amassing the most points. A list of the high
point scorers is as follows:

Harold Stone, 31 points; Ivan Tyndall,
23 points; Herbert Townsend, 20 points;
Tad Dietrich, 10 points; Rosaire LaSalle,
5 points.

The Indoor Fuselage Event was intro-
duced at this contest and Ivan Tyndall set
a state record for this type of ship with a
flight of 2 minutes, 6 seconds. The armory
in which these flights were made is only
twenty feet high!

The Burlington chapter is well organized
now and will begin inviting new members
to join. Those interested in the club are
asked to come to the meetings, which are
held at the YMCA at 4:30 P.M. on Mon-
day afternoons. Plans are now being made
for outdoor contests to be held in the
spring. These contests will feature gas
models.

California To Be Represented At Wakefield Meet

The Contest Board of the N.A.A. has
accepted a motion passed by the Academy
of Model Aeronautics at the November
meeting held in New York regarding the
extension of an invitation to West-Coast
model builders to send the winner of a rep-
resentative elimination contest to the In-
ternational Wakefield Competition as one of
the six modelers representing the United
States.

Due to the difficulty experienced by
West-Coast modelers in attending the Na-
tional Meet, where Wakefield enthusiasts

have competed for a place on the American
team, it was decided that a place on the
team be reserved for the winner of a rep-
resentative West-Coast meet, in order that
a more equal national representation be
arrived at.

An invitation was officially sent to Mr.
John Bunch, Chairman of the Gas Model
Committee of Southern California, and
plans are now under way to organize an
Annual Championship West Coast Meet to
determine the flyer who will be sent as a
Wakefield team member.

This plan does not in any way eliminate
West-Coast modelers from competing for
a place on the team at the National meet.
It is presented in the interests of modelers
who might not be able to attend the Na-
tionals. For further information, write to
Mr. John Bunch, 5011 S. Hoover St., Los
Angeles, California.

International Aeronautic Calendar 1939

(F.A.I. General Council Meeting, Paris,
France, January 7th, 1939)
March 5-12—Royal National Aeronautic
Association Meet—Tripoli.
May 14—Aero Club of Switzerland—Bal-
loon Race of the Swiss National Expi-
sition—Zurich.
July 8-23—Second International Aeronautic
Salon—Brussels.
July 16-23—Royal National Aeronautic
Association Meet—Rimini.
September 4—Aero Club of the Republic of
Poland—International Competition for
the Gordon Bennett Cup—Warsaw.
October 1—Aero Club of France—Deutsch
Coupe de la Meurthe Race.

International Calendar of Model Meets
July 17-23—Cup of His Majesty, King
Petter II of Yugoslavia—Fairry Airport,
near London.
August 6—Wakefield Cup—United States.
August 7—Bousden Competition—Fairry
Airport, near London.
August 13-15—Prize of the President of
the Republic.
(This is a literal translation of the report
received from Paris.)

Insignia Contest

All modelers artistically inclined, are in-
vited to submit their designs for a suitable
insignia for the Twelfth National Cham-
pionship Model Airplane Meet. This insig-
nia should be symbolic of youth in aviation
through model building, National Aero-
nautic Association and the Detroit Metro-
politan Council of Exchange clubs. The
insignia shall show the Exchange Club em-
blem and the N.A.A. wings. All drawings
must be in the hands of the Meet Manager
by May 20th and shall be drawn in India
Ink. The winning insignia will be used on
letter heads, stickers and all literature in
connection with this year's National Meet.
Everyone is invited to submit one or more
drawings. There will be a \$15.00 cash prize
for the insignia selected. Send submissions
to Mr. Irwin Polk, 429 Seventh Avenue,
New York City.

CLUB PUBLICATION

Any club having its own publication, be it
a mimeographed sheet or printed magazine, is
requested to register with the Academy of

Model Aeronautics. Please fill out the enclosed circular and mail to the Academy of Model Aeronautics, at 429 Seventh Avenue, New York City.

NAME OF ORGAN _____

CLUB _____

EDITOR _____

ADDRESS _____

CITY _____

APPROXIMATE CIRCULATION _____

MONTHLY _____ WEEKLY _____ OTHER _____

Kansas State Model Convention

A convention to establish the Model Aeronautics Division of the Kansas State Aviation Association is to be held in Wichita, Kansas, on April 15-16. Such an organization is indeed unique in the annals of youth education primarily because a medium of contact is formed whereas the youth of Kansas will have the opportunity to present their mutual problems for careful analysis and consideration. It is indeed commendable that the youth leaders of Wichita and Kansas have the keen foresight and judgment to realize that youth to be served must indeed have an integral part in any program that is devised for their benefit.

Suppressed desires quite often develop mischievous and many times criminal traits in a youth's life. The expression of youth in constructive channels develops creative abilities, fosters good sportsmanship and molds character. Such organizations as the above mentioned one really contribute to the "American Way of Living."

Fitchburg

"The Landing Field," club publication of the Wachusett Model Aero Club of Fitchburg Y.M.C.A., Fitchburg, Mass., recently printed the following item:

"Starting last week the point system, that at one time worked so favorably with the Wachusett Model Aero Club, was put into effect. There will be no changes in it and a brief resume follows:

"Points will be awarded for all phases of club activities such as attendance at meetings, entering contests, placing in contests, building models and presenting them at meetings to be judged, bringing in new members and anything else done to make the W.M.A.C. a live wire organization."

Boston

From "Wing Overs," club publication of the Jordan-Traveler Aviation League, Boston, Mass., we glean the following bit of news:

Flash—Corrigan Goes the Right Way

"During his visit to Jordan Marsh Company on Jan. 23, Doug (Wrong Way)

PERFORMANCE! — — — DAY IN AND DAY OUT

With the New, Improved

PEE-WEE MOTOR

More Power—More Speed—More Endurance



Motor
Assembled,
Tested, and
Guaranteed

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This plane is large enough and stressed to carry the smaller gasoline engines.

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Duplicate this 26" boat and engine with which Bill Atwood set a new world's 15 cc. Class C record of 39.24 m.p.h. at Detroit. Boat racing gives you the thrill of thrills. **This offer good only while present stock lasts.** Check and mail this ad today.

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Corrigan had an opportunity to see the 18-ft. long J.A.L. low-speed wind tunnel in operation.

"Wilbur Tyler conducted the tests and the transatlantic flyer expressed much interest in the wind channel.

"After the tests, Tyler flew his Canadian open-class stick craft which holds the Dominion record. Corrigan was astounded at its low flying speed and its extreme lightness."

George S. Wheat Trophy Established for National Model Airplane Meet

The United Aircraft Corporation established this year the George S. Wheat Memorial Award, to be competed for in the annual National Championship Model Airplane Meet. Honoring the memory of the late George S. Wheat, former Vice President and Director of United Aircraft, the award consists of a handsome trophy and a cash award of \$250. He served as a Naval Intelligence officer during the world war, and subsequently was one of the organizers of the American Legion. He had been identified with United Aircraft and its predecessor companies from 1925 until his death last December, and was one of the most widely-known and best-liked men in the entire aviation industry. The establishment of the award bearing his name is a tribute to his strong belief that the future of the industry was dependent on fostering and encouraging the keen interest in aviation displayed by modern youth.

Dealer Help

We believe that we have a plan that will help you increase your sales. It's a simple plan too—all you have to do is send us your name and address, on your own letterhead if possible. Many manufacturers have told us that they would like to augment their display advertising with personal letters, circular matter, display cards, tips on new items and other dealer helps. After the list is compiled it will be circulated among the trade. We believe that you will profit by this. Therefore if you are a model airplane dealer it will be to your advantage to send in your name without delay. The 1939 Dealer List will be compiled during April and May. Address: MODEL AIRPLANE NEWS, Census, 551 5th Ave., New York City.

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MODEL AIRPLANE & SUPPLY CO.

129 W. 29th St., Chicago, Dept. MNS,
Eastern Branch: 638 Broadway, New York, N.Y.

Next Month, COMET will present on THIS PAGE:



CARL GOLDBERG'S Latest and Greatest Achievements in GAS MODELS

STARTLING PERFORMANCE DATA

When figures are released next month, gas model builders will be in for a real surprise. Both of these new models embody all the designing genius and engineering skill which has made the name of Carl Goldberg synonymous with top-flight achievement in the gas model field.

OVER a year ago, Carl Goldberg applied himself to the task of designing two new gas models which would outperform anything in the gas model field. On or about May 8th, these two sensational achievements (for large and small motors) will be available through your Comet dealer. The most thoroughly tested gas models ever developed, they are certain to earn the enthusiastic approval of every gas model builder. Already, these ships have won eight first places in ten events, and have startled observers with their remarkable ease of handling, extreme stability even in inexperienced hands, and astonishing sailplane glide. Both ships conform to the new N.A.A. rules. And because they are manufactured in Comet's new and greater factory, with the latest time-and-money-saving machinery, they will be offered at prices that will make them amazing values.

Already model builders are asking: what do the new Comet Gas Models look like? What will they do? How much will they cost? The answers to these and other questions will be found next month on this page. Be sure to watch for the next Comet ad!

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About May 8th
at



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